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ERRATUM

Vol. **14.** no. 12. p. 441, para. 3.—For "500 g. brown powdered bentonite were added slowly to 750 ml. water . . .", read "to 500 g. brown, commercial hexachlorethane mixed with 50 g. powdered bentonite were added slowly 750 ml. water . . .".

REVIEW ARTICLES

(1) " The Present Position of Phenothiazine as an Anthelmintic ".

(2) " Trichomoniasis—A Review of Recent Literature ".

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IMPERIAL BUREAU OF ANIMAL HEALTH

THE

VETERINARY BULLETIN

Vol. 15.] March, 1945. [No. 3.

DISEASES CAUSED BY BACTERIA AND FUNGI

BREED, R. S. (1944). **Mastitis infections and their relation to the milk supply.**—*J. Milk Technol.* **7.** 143–155. **437**

A general article for dairy farmers. Brief mention is made of the organisms associated with mastitis but no new material is included.—G. J.

JULIANELLE, L. A. (1944). **Experimental staphylococcal infection and passive protection.**—*J. Immunol.* **48.** 155–161. **438**

Attempts were made to overcome the irregular results which commonly follow the experimental infection of rabbits and mice with staphylococci. A large number of strains isolated from cases of septicaemia in man were studied. Animal passage, with the use of infected heart blood or peritoneal fluid, failed to elevate the virulence of the strains or to increase the regularity of the results.

In order to depress the resistance of rabbits, benzene was given to induce a toxic leucopenia, but the method proved to be unsatisfactory.

It was not possible to assess the value of passive protection with antibacterial serum or antitoxin given prior to the intraperitoneal or intravenous injection of culture, because the results in the controls were irregular.

It was possible to establish generalized staphylococcal infection in developing chick embryos by injecting small amounts of culture into the yolk-sac or chorio-allantois. Antisera, however, completely failed to control such infection. Finally the initiation of localized infection in the rabbit was tried, two different sites being used. Small volumes of dilute culture caused abscess formation when injected into the cornea. Antiserum was shown to prevent such lesions, but the protection was transient and typical lesions developed after the initial delay. There are other obvious disadvantages in this difficult technique.

Intracutaneous injection with 0·5 ml. dilute culture was also used. A localized infection resulted which reached its peak within 48 hours and the lesion persisted for 4–6 weeks. In a number of experiments where 1·0 ml. of type A staphylococcal antiserum was injected together with type A strains, there was a complete absence of reaction, but further trials with normal sera and type B serum also revealed some nonspecific protection.

In the discussion, it is concluded that in the absence of extraneous factors such as trauma or lowered resistance in the host, the staphylococcus is not highly infective in the rabbit or mouse. Generalized infection was achieved only in the chick embryo. Only large doses of antisera were of value, and active phagocytosis appeared to be necessary for the success of such treatment.—J. KEPPIE.

BEAMER, P. R., GOODOF, I. I., & SMITH, E. B. (1944). **Evaluation of clinical laboratory tests for pathogenic staphylococci based on histologic examinations of lesions in the tissues.**—*Amer. J. clin. Path.* **14.** 350–357. [Authors' summary copied *verbatim*]. **439**

1. Fifty-five strains of Staphylococcus (39 *aureus*, 16 *albus*) were cultured from suspected lesions in patients at autopsy. Tissues were examined histologically to demonstrate the presence of the organism and a characteristic lesion.

2. Several commonly used, clinical laboratory tests for pathogenicity were performed (for example, hemolysis, pigmentation, mannitol fermentation, coagulase activity, gelatin liquefaction, pathogenicity for animals) and the results were compared with the histologic observations.

3. Not infrequently, organisms which were associated with characteristic lesions failed to give positive results in one or more of the above tests.

4. Variations in the occurrence of positive results in the tests mentioned above occur often enough to make these criteria, *per se*, inadequate for the estimation of pathogenicity of a given strain. In the presence of confirmatory clinical findings any staphylococcus should be considered as potentially pathogenic, although the usual tests for pathogenicity may be negative.

MAGRASSI, F. (1942). Studi su un fattore ad azione autobatteriostatica presente in alcuni ceppi stafilococci. [**A factor produced by certain strains of staphylococci, limiting the growth of the organism**]. —*Z. Hyg. InfektKr.* **124.** 488–512. [In Italian; German summary]. **440**

In certain strains of staphylococci, two of which were isolated from cases of chronic endocarditis, a bacteriostatic phenomenon was observed in which the reproductive capacity of the strains diminished both in broth and on plates. The agent could be transmitted either *in vitro* or *in vivo* to other strains. M. does not consider it to be a bacteriophage.—D. L. ROBARTS.

ELLIOTT, S. D. (1943). **Type relationships amongst group A streptococci.**—*Brit. J. exp. Path.* **24.** 159–170. **441**

It has recently been shown by Lancefield that some group A streptococci contain two or more antigens (designated M and T substances) both of which may participate in the agglutination of streptococci by homologous sera absorbed by Griffith's method. The specificity of these substances may vary in different streptococcal types, resulting in some of the anomalous cross-reactions constantly encountered in the identification of Group A strains. E. gives the results of his examination of certain cross-reacting types, conducted with a view to determining the nature of the M and T

factors. The T antigen was distinguished by its resistance to tryptic digestion and by its destruction by a temperature of 100°C. to which the M substance is resistant. The non-specific group A antigens are resistant both to 100°C. and overnight tryptic digestion. For identification of the antigens in the types studied by slide-agglutination tests, M antigen is best distinguished in cultures grown at 37°C. and T antigen in cultures grown at 22°C. and sometimes by adding 0·2% glucose to the broth. Organisms containing both antigens can thus be subject to diphasic variation, according to cultivation in which M or T antigen is dominant or where both may appear together. Rabbits immunized with such cultures produce antibodies corresponding to both antigens. Boiled or digested vaccines produce antisera containing either M or T antibodies respectively. Monophasic variants of diphasic types may be encountered. As there is evidence that the association between individual M and T antigens is not constant, it appears that for precise identification of a strain a full analysis of its M and T components is necessary. Reasons associated with difficulties of culture, suspension, and production of typing sera are given as to why the full identity of types cannot always be determined by the slide-agglutination test.—H. I. FIELD.

LANCEFIELD, R. C. (1943). **Studies on the antigenic composition of group A hemolytic streptococci. I. Effects of proteolytic enzymes on streptococcal cells.** —*J. exp. Med.* **78.** 465–476. 442

LANCEFIELD, R. C., & STEWART, W. A. (1944). **Studies on the antigenic composition of group A hemolytic streptococci. II. The occurrence of strains in a given type containing M but no T antigen.**—*Ibid.* **79.** 79–88. 443

WATSON, R. F., & LANCEFIELD, R. C. (1944). **Studies on the antigenic composition of group A hemolytic streptococci. III. Types with serologically identical M but distinct T antigens : types 10 and 12.**—*Ibid.* 89–98. 444

STEWART, W. A., LANCEFIELD, R. C., WILSON, A. T., & SWIFT, H. F. (1944). **Studies on the antigenic composition of group A hemolytic streptococci. IV. Related T but distinct M antigens in types 15, 17, 19, 23, 30, and in types 4, 24, 26, 28, 29, 46. Identification by slide agglutination.**—*Ibid.* 99–114. 445

I. Trypsin was found to destroy the M substance of both living and dead cells of group A streptococci. Trypsin-treated cultures failed to induce the formation of M antibodies in rabbits, but allowed the formation of T antibodies. Trypsin possessed no bactericidal effect on the streptococci. Subculture destroyed the ability of the strains to form M substance. Proteolytic enzymes destroyed neither C substance nor the antigenic portion responsible for non-type-specific agglutinins. Trypsin-treated cultures behaved antigenically in the manner of glossy variants of a matt culture.

II. It was shown that certain strains of group A streptococci which proved to belong to one type by M precipitin reaction lacked the T substance of that type and hence neither agglutinated in anti-T serum nor absorbed anti-T agglutinins. The strains produced no anti-T agglutinins when injected into rabbits. Other strains known to contain T antigen failed to agglutinate anti-T serum. This is explained by T agglutination being blocked by an excess of M substance.

III. Representative matt strains of type 10 and type 12 contained serologically identical M antigens but unrelated T antigens. The strains were tested by agglutinin, precipitin and passive protection tests with unabsorbed and reciprocally absorbed antisera. The significance of these findings is discussed, especially in connexion with cross-reactions in the typing of strepto cocci.

IV. The difficulties of distinguishing the types closely related strains of group A haemolytic streptococ led to the present investigation. It was found that th cross-reactions which had been observed betwee certain types could be explained by the possession related T but distinct M antigens in types 15, 17, 1 23 and 30, and also in the series 4, 24, 26, 28, 29 and 4 Strains of certain of the types investigated containe no T antigen. Analysis of the results of this wor points to the fact that Griffith distinguished certai types on the basis of M antigen and others on the basi of T antigen. In an appendix to the paper method are described for the preparation of specific antisera fo slide agglutination tests.—D. L. ROBARTS.

ROSENOW, E. C. (1944). **The production of a filtrabl infectious agent from alpha streptococci.**—*Amer. J clin. Path.* **14.** 150–167. 44

Streptococci isolated from the nasopharynx of human being with broncho-pneumonia proved neuro tropic in mice, producing an encephalitis. Afte successive passage in mice, the strain produced symp toms of encephalitis in monkeys as well as in mice After further passage in monkeys the strain lost it virulence for mice. The disease in monkeys ver closely resembled virus poliomyelitis. The infectiou agent was filtrable and resisted glycerin. Monkey which had recovered from the disease caused by thi infectious agent resisted infection with known polio myelitis virus, and monkeys recovered from viru poliomyelitis resisted infection with this new infectiou agent. R. concludes that the infectious agent obtaine from the neurotropic streptococcus was indistinguishabl from true poliomyelitis virus. Some evidence tha epidemic poliomyelitis virus consists of phases of specific type of streptococcus was obtained by th finding of diplococci in filtrates of chick-embry cultures of the neurotropic streptococcus and also i filtrates of the "natural" poliomyelitis virus.

The virus was considered a filtrable phase of th streptococcus. That this work was not complicated b accidental contamination by a spontaneous virus in th stock mice is assumed in that 43 mice inoculated wit the brains of the stock mice used remained normal.

—D. L. ROBARTS

LAMANNA, C. (1944). **A non-life cycle explanation o the diphtheroid streptococcus from endocarditis.**—*J Bact.* **47.** 327–334. [Author's summary copie *verbatim*]. 44

A new isolation of an alpha-hemolytic streptococcu from a case of sub-acute endocarditis which forme diphtheroid-like cells on solid media is reported Evidence is presented indicating that the organism i a true streptococcus which assumes a diphtheroi appearance only under the adverse conditions of *aerobi* culture. The normal streptococcus can be stained t show transverse bands of heavily stained protoplasm which enhance the diphtheroid appearance whe division, but not growth, is inhibited and the cell assume other than the coccus shape. The life cycl postulated by several past investigators for the diph theroid streptococcus from endocarditis is rejected.

SMITH, H. R. (1943). **Market losses from tuberculosi today as compared with twenty-five years ago.**— *Proc. 46th Meet. U.S. Live Stk sanit. Ass., 1942.* pp 79–83. 44

The records of the Division of Meat Inspectio [Bureau of Animal Industry] give an accurate year t year picture of the prevalence of TB. in livestock in th U.S.A. The records show that the percentage of cattl

" retained for the disease in the United States " increased from 0·9% in 1907 to 2·1% in 1917. The percentage of pigs " retained " for TB. over the same period rose from 2 to 9·8%. By 1930, a large proportion of cattle had been tuberculin tested and the percentage reacting in the entire country had been reduced from 4·5% in 1917 to 1·6%. By 1940, as is well known, all states had been accredited as practically free from TB. As a result the proportion of cattle " retained " decreased to 0·06% in 1942. In pigs the situation was less favourable. There was an increase in pigs " retained " from 9·9% in 1917 to 13·5% in 1927 and since then there has been a decrease to 8% in 1942. The continued high retention rate is due to the prevalence of TB. in poultry in the north-central states.
—D. D. OGILVIE.

LOCHEAD, D. C. (1943). **Bovine tuberculosis in humans.**—*Proc. 46th Meet. U.S. Live Stk sanit. Ass., 1942.* pp. 75–78. **449**

Whereas 25 years ago in the U.S.A., manifestations of bovine type TB. in human beings (tuberculous joints, neck lymph nodes, etc.) were common, to-day cases are rarely seen in medical clinics. In general, all over the U.S.A. the practical eradication of bovine TB. has been followed by a steady decline in the human incidence of the disease, and in some areas there has been a spectacular disease. Control of TB. in the human subject has lagged behind veterinary activities ; group tuberculin testing of human beings, however, has commenced in certain localities in Minneapolis with the object of setting up accredited areas where early cases are detected.—D. D. OGILVIE.

TIPPETT, S. G. (1943). **Calmette's criticism of our present methods for the prevention of tuberculosis now proved to be fully justified.**—*Med. Pr.* Dec. 22nd. 399–400. **450**

The decision of the British medical authorities to attempt to control TB. by hygienic measures alone, without resorting to the use of BCG vaccination, was criticized by CALMETTE (1933). T. now agrees with Calmette, on the basis that mass radiography has revealed a much greater incidence of pulmonary TB. than was previously indicated by other approved methods of diagnosis and that this points to the urgent necessity of introducing a more satisfactory method of control. He considers that preventive vaccination is the only measure which would answer the purpose.
—H. SCOTT MCTAGGART.

FOLEY, H., & PARROT, L. (1943). L'infection tuberculeuse et la vaccination par le B. C. G. chez les indigènes d'Algérie. **[TB. in indigenous races in Algeria : vaccination with BCG].**—*Arch. Inst. Pasteur Algér.* **21.** 233–254. **451**

The incidence of TB., as determined by the von Pirquet skin test, is discussed in relation to the ecology of the indigenous races in Algeria. Information obtained from various investigations sponsored by the Pasteur Institute at Algiers during the past 32 years is summarized in 17 pages of tables. BCG vaccination is put forward as the most efficacious means of combating the disease and the epidemiological information presented is used to outline certain general recommendations for its application.—H. SCOTT MCTAGGART.

I. LURIE, M. B. (1944). **Experimental epidemiology of tuberculosis. The prevention of natural air-borne contagion of tuberculosis in rabbits by ultraviolet irradiation.**—*J. exp. Med.* **79.** 559–572. **452**

II. LURIE, M. B. (1944). **Experimental epidemiology of tuberculosis. Hereditary resistance to attack by tuberculosis and to the ensuing disease and the effect of the concentration of tubercle bacilli upon these two phases of resistance.**—*Ibid.* 573–589. **453**

[Author's conclusions copied *verbatim*].

I. 1. Ultraviolet irradiation of the air of a room exercises a protective influence against natural air-borne contagion of tuberculosis in rabbits.

2. When the radiant energy is of low intensity it reduces considerably the incidence of tuberculosis. (a) It completely protects rabbits of high natural resistance from acquiring demonstrable disease though they become tuberculin sensitive. (b) It fails to protect a small proportion of rabbits of low natural resistance from fatal tuberculosis.

3. When the radiant energy is of high intensity all rabbits, whether of high or of low natural resistance, are almost completely protected from a contagion so severe that it is fatal to the great majority of rabbits of the same genetic constitution not protected by these rays. The protected rabbits do not develop tuberculin sensitivity.

4. The contagion of tuberculosis in these studies is air-borne and the radiant energy exercises its protective influence by its bactericidal properties. It is probable that ultraviolet irradiation may control air-borne contagion of human tuberculosis.

II. 1. Hereditary resistance to attack by air-borne tubercle bacilli is distinct from the resistance to the ensuing disease.

2. One inbred rabbit family has little resistance to attack by the microorganism but has considerable resistance against the ensuing disease.

3. Another inbred family has considerable resistance against attack by the tubercle bacillus but has little resistance against the ensuing disease.

4. Increasing concentrations of tubercle bacilli in the environment of the family of high genetic resistance to the disease increase the incidence of infection, accelerate the onset of the disease, and affect its essential character in proportion to the concentration of the microorganism.

5. Up to a certain concentration of tubercle bacilli in the environment of the families of low genetic resistance to the disease, increasing concentrations of the infectious agent also increase the incidence of the disease and accelerate its onset, although its anatomical character is always of a uniform rapidly progressive type. Beyond this concentration further increment of the infectious agent exercises no effect.

BOISSEVAIN, C. H. (1943). **Growth promotion of bovine tubercle bacilli by pyruvate.**—*Proc. Soc. exp. Biol., N.Y.* **54.** 344–345. **454**

Three strains of bovine tubercle bacilli freshly isolated from the livers of rabbits injected with an emulsion of tuberculous calf lymph nodes grew luxuriantly on Long's medium supplemented with 0·1% pyruvate, although no growth could be obtained on the unsupplemented synthetic medium. Two out of three " dysgonic " bovine laboratory strains exhibited similar behaviour, but pyruvate was without effect on the growth of any of the 12 human strains which were tested.—J. LOCHIEL MCGIRR.

MAYER, R. L. (1944). **The influence of sulfanilamide upon the yellow pigment formed by *Mycobacterium tuberculosis* from p-aminobenzoic acid.**—*J. Bact.* **48.** 93–96. [Author's summary copied *verbatim*]. **455**

1. Under certain conditions the formation of a yellow pigment in cultures of *Mycobacterium tuberculosis* in the presence of PABA and procaine is diminished or inhibited by sulfanilamide.

2. To explain this inhibitory effect, the hypothesis of a direct chemical reaction between the oxidation

products of PABA and sulfanilamide is propounded and discussed.

MIRANDA, O. S. (1943). Hipersensibilidad de la toxina de Preisz-Nocard. **[Hypersensitivity to *Corynebacterium ovis* toxin]**.—*Rev. Med. vet., B. Aires.* **24.** 351–375. **456**

M. notes the development in g. pigs of a hypersensitivity to *Corynebact. ovis* toxin, resembling that described by BEHRING in connexion with diphtheria toxin. Hypersensitive g. pigs died within 24–48 hours of the provoking injection, and P.M. there was revealed haemorrhage into the intestinal tract, congestion of the liver, and haemorrhages in the kidneys.—I. W. B.

LEGROUX, R., & BLANC, G. (1943). Nouveaux éléments de rapprochement des bacilles de la morve, de Whitmore et pyocyanique. **[New factors indicating relationship of *Pfeifferella mallei*, *Pf. whitmori*, and *Pseudomonas pyocyanea*]**.—*Ann. Inst. Pasteur.* **69.** 49–52. **457**

Thirty-one strains of *Ps. pyocyanea* were tested against antiserum prepared in a sheep with a strain of *Pf. whitmori.* Suspensions of ten of the strains were agglutinated by a titre of 1 : 50 or more of the serum. By the use of the same antiserum, ten strains of *Pf. mallei* were tested and agglutination occurred at dilutions greater than 1 : 100 in 8 cases.

The authors conclude from their immunological relations and other more general factors, that there exists a close similarity between *Pf. mallei, Pf. whitmori,* and *Ps. pyocyanea.*—R. M. ARNOLD.

PETERMAN, J. E. (1944). **Diagnostic chart of swine erysipelas.**—*J. Amer. vet. med. Ass.* **105.** 10–11. **458**

A chart is presented, for the use of practitioners, of the symptoms of swine erysipelas, under the four headings :– (1) symptoms characteristic of S.E. ; (2) symptoms characteristic of chronic S.E. ; (3) symptoms not characteristic of S.E. (characteristic of swine fever), and (4) symptoms characteristic of various other diseases.

P.M. lesions are not mentioned. The economic importance of clinical diagnosis is emphasized.

—R. M. LOOSMORE.

STILES, G. W. (1944). **Swine erysipelas organisms recovered from a brown rat (Rattus norvegicus).** —*Amer. J. vet. Res.* **5.** 243–245. **459**

In the course of a bacteriological examination of 100 rats selected at random from some thousands killed in an extermination campaign, one culture of an organism resembling *Erysipelothrix rhusiopathiae* was discovered. The affected rat was deformed and diseased. Its right hind leg was swollen and gangrenous, there were sloughs on its tail, and the right inguinal lymph node and the spleen were enlarged and haemorrhagic. The organism, which was isolated from a suspension of spleen, lymph node, and diseased muscle, proved to be pathogenic for white mice and pigeons and to have the cultural characters of *E. rhusiopathiae.*

[The description given might apply equally to *E. muriseptica,* which may or may not be identical with *E. rhusiopathiae.*]—ISOBEL W. BROCKLEHURST.

URBAIN, A., NOUVEL, J., & ROTH, P. (1943). Septicémie à bacille du rouget chez une perruche (*Palaeornis torquata,* L.). **[Septicaemia in a ring-necked parakeet due to *Erysipelothrix rhusiopathiae*]**.—*Bull. Acad. vét. Fr.* **16.** 136–138. **460**

The authors report infection with *E. rhusiopathiae* in a ring-necked parakeet dying in the Jardin des Plantes, Paris. The only external lesion was a caseous tumefaction about the size of a pea on an eyelid. Autopsy revealed congestion of all the hollow organs. *E. rhusiopathiae* was isolated from the heart blood. Two mice inoculated with a 48-hour culture of this organism died five and six days later, whereas two mice receiving in addition *E. rhusiopathiae* antiserum, survived.

This is stated to be the first report of this infection in this species. The authors name many other wild birds in captivity in which the infection has been reported. Reports of its occurrence in wild birds are rare.

—R. M. LOOSMORE.

*DE BLIECK, L. (1942). Immunisatie tegen coryza infectiosa gallinarum. **[Immunization against fowl coryza]**.—*Tijdschr. Diergeneesk.* p. 204. [Abst. from abst. in *Skand. VetTidskr.* **33.** 432 & 433]. **461**

Nelson's three types of infectious coryza, caused respectively by *Haemophilus coryzae,* an unnamed coccobacillus, and by both these organisms in association, are briefly described. Immunization against the first type can be carried out by means of two intravenous injections on successive days of live culture or by three successive injections, made during the course of a week, of cultures killed by formalin. In tests made by the author, both methods conferred immunity against intranasal deposition of nasal exudate from naturally affected birds.

With the second type of disease, the exudate from the infra-orbital pouch of naturally affected fowls was both infective and immunizing, depending on the amount given intranasally to susceptible chicks. The subcutaneous route or that *via* the bursa Fabricii were unsuitable for immunizing purposes.—J. E.

SLAVIN, D. (1944). **Somatic variation in some Kenya strains of salmonella.**—*Vet. J.* **100.** 2–10. **462**

S. noted a marked cross-agglutination which occasionally occurred between O sera prepared from local strains of *S. typhi-murium* and of *S. dublin.* Two variants of *S. dublin* were identified. Variant A possessed the nonspecific factor XII, while variant B possessed pure IX complex. Pathogenicity tests on mice showed that variant B was pathogenic and variant A non-pathogenic. S. believes that this diphasic somatic variation is not uncommon in strains isolated in Kenya.—ANTHONY BUXTON.

CRAIGE, J. E. (1944). **The isolation of Salmonella anatum from the feces of a dog.**—*J. Amer. vet. med. Ass.* **105.** 33–34. **463**

C. tentatively suggests that *S. anatum,* isolated in significant numbers from the faeces of one of two dogs with diarrhoea and encephalitic symptoms, may have been the cause of the condition. No bacteriological examination was made of the faeces of the second dog. Both dogs recovered following sulphaguanidine therapy. The possible danger to human beings of this type of infection in dogs and cats is pointed out.—R. M. L.

GEYR. (1942). Ueber das Vorkommen von Bact. ent. Breslau im Wasser der Niers. **[Occurrence of *Salmonella typhi-murium* in the river Nier (Rhineland)]**.—*Z. Fleisch- u. Milchhyg.* **52.** 267–269. **464**

In 1938, salmonella infections in calves and cattle were not infrequent in the district watered by the river Nier. The river water was sampled in 19 different places ; *Salmonella typhi-murium* was found in five places. One strain was rhamnose-negative : this strain was isolated from the water of a mill-pool used by water birds as a bathing place.—D. L. ROBARTS.

HORMAECHE, E., PELUFFO, C. A., & DE PEREYRA, V. R. (1944). **A new salmonella type, *Salmonella carrau,* with special reference to the 1,7 · · · phases of the Kauffmann-White classification.**—*J. Bact.* **47.** 323–326. [Authors' summary copied *verbatim*]. **465**

A new [but see *V. B.* **13.** 158.] *Salmonella* type,

S. carrau, is described. Six strains isolated in Uruguay and one found in Mexico were studied. The antigenic formula of *S. carrau* is : VI, XIV, XXIV : y–1,7 · · ·. It has been found in the feces and blood of human beings, in normal pigs and was once isolated from flies.

We have found that *Salmonella* types having factor 7 in phase 2 must be divided into two sub-groups. Types of sub-group I have a distinct factor designated by " + ", which is lacking in strains of sub-group II. *S. arechavaleta*, *S. altendorf*, *S. gaminara*, *S. florida*, *S. kapstaad*, and *S. pomona* belong to sub-group I. Sub-group II contains *S. bredeney*, *S. carrau*, *S. grumpensis*, *S. selandia*, *S. give*, *S. new-brunswick*, *S. nyborg* and *S. madelia*.

McNaughtan, J. (1944). **The typing of strains of *Bact. paratyphosum* B by the biochemical method of Kristensen and Bojlen.**—*J. Hyg., Camb.* **43.** 411–412. **466**

The typing of 290 strains of *Salmonella paratyphi* B, isolated during an epidemic, was carried out by using rhamnose, inositol and Bitter's rhamnose media ; 283 of these strains were identified as being similar in type.

The author stresses the epidemiological importance of carrying out such typing, especially in connexion with tracing the origin of an outbreak.—A. Buxton.

Levine, M. G., & Plattner, E. B. (1944). **Salmonella pneumonia.**—*Amer. J. clin. Path.* **14.** 342–343. [Authors' summary copied *verbatim*]. **467**

Three [human] cases of Salmonella suipestifer pneumonia are reported in which the primary symptoms were pulmonary. Blood cultures and agglutination tests with the suipestifer strain are urged to detect more cases of suipestifer infection. Sulfathiazole orally was of value in these cases therapeutically.

Hinshaw, W. R., McNeil, E., & Taylor, T. J. (1943). **Four years progress in eradication of pullorum disease from turkey flocks.**—*Proc. 46th Meet. U.S. Live Stk sanit. Ass., 1942.* pp. 224–237. **468**

A previous report [see Hinshaw *et al.*—*V. B.* **11.** 748.] has been given of two years' progress of a pullorum-disease eradication scheme for turkeys. The results of four years' progress are now described. These results are compared with those obtained by unorganized testing where eradication was not the ultimate aim. When the observations commenced the two groups showed about the same incidence of infection, *viz*, 51% of the flocks and 31% of the birds. At the beginning of the fourth year the experimental group had all of its birds free on first test while in the other group, 20% of its flocks and 7·8% of its birds were free.

About 213 reactors from these tests were examined bacteriologically ; *Salmonella pullorum* was isolated from 87 (40·8%) of these. The oviduct appeared to be even more important than the ovary for search for the organisms.

The agglutination test was generally reliable, but a few nonspecific reactions were often encountered in flock tests. Cocci were the predominating organisms found in these cases.

Cloudy reactions present a considerable problem in testing laying turkeys. Reduction of the phenol content of antigens by using non-phenolated saline for dilution has helped to overcome this difficulty. The tubes are incubated at 50°C. for 4–5 hours and at room temperature overnight.

An important practical step in eradicating pullorum disease has been the use of eggs from certified flocks only and the incubation of these away from eggs not similarly certified.—D. D. Ogilvie.

Higgins, W. A., Christiansen, J. B., & Schroeder, C. H. (1944). **A *Salmonella enteritidis* infection associated with leg deformity in turkeys.**—*Poult. Sci.* **23.** 340–341. **469**

The authors report an outbreak of *S. enteritidis* infection in a flock of 900 turkeys, approximately 24 weeks old, which caused inflammation of the hock joint in 100 of the birds. Mortality was not high. *S. enteritidis* was isolated from the bloodstream and from a purulent exudate in the tendon sheaths. X-ray photographs of some infected joints are shown.—A. Buxton.

Avvakumov, M. E. (1941). Opyt oftal'modiagnostiki brutselleza u loshadeĭ spetsificheskim allergenom. **[The ophthalmic test using specific allergen in the diagnosis of brucella infection in horses].**—*Trud. XV Plen. vet. Sekt. Akad. sel'khoz. Nauk, Moscow, 1939.* [*Diseases of Horses*]. pp. 118–122. **470**

A. considers that serological reactions in horses are not reliable for the diagnosis of brucellosis, since serum antibody titres in horses fluctuate and the antibodies sometimes disappear temporarily from the serum. A concentrated " ophthalmo-brucellin " was therefore prepared, consisting of bacilli and their detritus ; it was tested for several years in cattle and results were compared with those of agglutination and intradermal tests. The brucellin was then tested on horses. A group of six experimentally infected animals reacted positively, whereas three horses affected with equine infectious anaemia and four normal horses did not react. Out of a further 41 horses exposed to infection, six gave a pronounced reaction, five a less pronounced, and one a doubtful reaction ; of these, four had yielded an agglutination reaction at 1 : 100 and four a reaction at 1 : 50. In a third group, consisting of 53 horses, six gave a positive reaction to " ophthalmo-brucellin " and two a doubtful reaction ; in all these animals the aggln. and complement-fixation tests were negative. In all cases, the reaction to " ophthalmo-brucellin " became most pronounced after 5–9 hours. A. considers that this test is more reliable than serological tests for the diagnosis of brucellosis in horses.—A. Moldawsky.

Viridén, P. (1943). Kalvympning vid bekämpandet av den smittsamma kastningen. **[The inoculation of calves for the control of infectious abortion].**—*Skand. VetTidskr.* **33.** 737–745. [English summary]. **471**

The problem is discussed of eradicating acute infection in herds lacking isolation facilities and therefore requiring some type of active immunization. The American strain 19 live vaccine does much to ease this problem, as applied to young calves, and the use of the vaccine in Sweden is recommended. It has already been tested there on a small scale. V. states that vaccination of heifers over six months of age is inadvisable, as the serological reactions set up persist for longer in older animals and there is risk of colonization of the udder by the vaccine strain in older heifers with mammary gland development.—J. E.

*Pop, A., Marinow, I., & Ogeru, D. (1942). Recherches sur la brucellose. **[Brucellosis in Rumania].**—*Arch. roum. Path. exp. Microbiol.* **12.** 5–52. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **142.** 497]. **472**

Strains of brucella isolated in Rumania have always proved to be *Brucella abortus* except for one strain from a case of orchitis in a boar which proved to be *Br. suis*. In districts where bovine contagious abortion occurred, 4·15% of the human population had a latent infection as revealed by serological reactions and of this percentage 0·81% had shown clinical signs of undulant fever. 28·24% of cattle were infected in the areas investigated and in certain areas the figure was as high as 70%.

In agricultural districts, 30% of pigs had a latent infection; in breeding establishments in which abortion in pigs was common, the percentage was 96·98%. Immunization of pigs was unsuccessful and veterinary police methods were used in the control of the disease. The authors consider serological tests more valuable than allergic tests in pigs. The epizoology of swine abortion was quite different from that of bovine abortion. Where abortion in cattle was common, 26·42% of horses were also infected. Up to 42·5% of dogs on infected farms carried a latent infection with a serum titre of up to 1 : 400. On such farms, up to 37% of the sheep were also infected. Swine abortion appeared to be especially dangerous for sheep in that 37% of sheep actually aborted on farms where swine abortion was common. 1·5% of hens carried latent infections.

—D. L. ROBARTS.

BUTLER, H. M. (1943). **The pathogenicity of washed Clostridium welchii and the mode of development of Clostridium welchii infections in man.**—*Med. J. Aust.* Sept. 18th. pp. 224–227. **473**

Washed bacilli from 49 of 73 recently isolated strains of *Cl. welchii* cultured on solid media were pathogenic for g. pigs when 0·1 ml. was injected intramuscularly, but the ability of the bacilli to set up an infection declined rapidly during storage. It is suggested that the invasiveness of *Cl. welchii* in infections can be determined on the basis of capsulation and resistance to phagocytosis as revealed by examination of direct smears. The three groupings proposed are :– strains which can invade healthy tissue, those which can invade only damaged tissue, and those which cannot invade even damaged areas.—D. F. STEWART (AUSTRALIA).

SVEC, M. H., & MCCOY, E. (1944). **A chemical and immunological study of the capsular polysaccharide of** *Clostridium perfringens* [*Cl. welchii*].—*J. Bact.* **48.** 31–44. [Authors' summary copied *verbatim*]. **474**

A method of isolation of the capsular polysaccharide of *Clostridium perfringens* is offered, as well as analyses of preparations secured by variations on this method. Antigenicity of three of these preparations has been established. Precipitation and agglutination tests indicate a common capsular polysaccharide for most, if not all, strains of *C. perfringens*. The recommendation is made that sera for agglutinations be prepared, if possible, by injection of polysaccharide adsorbed upon some inactive carrier to avoid, wherever practicable, the use of whole cells as antigens. Agglutination reactions with such sera are suggested as aids in diagnosis of *C. perfringens* in gas gangrene, or in classification of this organism with the reservation that the procedure indicates nothing concerning the fermentative or toxigenic capacities of the strain under consideration.

DUKALOV, I. A. (1941). Osnovy bor'by s botulizmom loshadeï. **[The basis for control of equine botulism].**—*Trud. XV Plen. vet. Sekt. Akad. sel'khoz. Nauk, Moscow, 1939.* [*Diseases of Horses*]. pp. 100–102. **475**

D. reviews various outbreaks of botulism, most of which were due to the feeding of silage, and he discusses the prevention of the disease. He states that arecoline given to horses in the early stages of the illness reduces the losses. [No scientific evidence is given.]—A. M.

—. (1944). **Infections with non-sporing anaerobes.**—*Lancet.* **246.** 409. **476**

A short review of the pathogenicity of non-sporing anaerobes such as the anaerobic streptococcus and *Fusiformis necrophorus*. In human medicine, these organisms are not infrequently isolated by anaerobic blood-culture from cases of metritis and peritonitis. Such cultures reveal a non-haemolytic streptococcus or a fine Gram-negative bacillus alone or associated wi other bacteria such as diphtheroids, enterococci, coliform bacteria. The strains of *F. necrophor* isolated from human material are poorly pathogenic f laboratory animals and thus differ from those found calf diphtheria, foot-rot, and labial necrosis of rabbi The name "*pseudo-necrophorus*" has been suggest for the human variant.—J. KEPPIE.

HALL, W. E. B. (1944). **Actinomyces in the tonsil**—*Amer. J. clin. Path.* **14.** 215–228. [Abst. fro author's conclusion]. **4**

Actinomyces of the tonsillar crypts of human being frequently demonstrable histologically in typical a atypical forms, is a true pathogen, existing and growi in a relatively saprophytic state locally, causing varyi degrees of inflammatory reaction in adjacent tonsil tissues and capable, on discharge or transportation other tissues, of producing a typical, dangerous, path logic actinomycotic lesion. Tonsils carrying or pr ducing debris or granules are thus potential sources this fungus and their removal is advised.

NEUFELD, F. (1942). Untersuchungen über d Bakterien der menschlichen Haut und über d natürlichen Abwehrkräfte der Haut und der Schlein häute. **[Bacteria of the human skin and muco membranes].**—*Z. Hyg. InfektKr.* **124.** 429–440. **4**

Staphylococcus epidermidis was found on all pa of the human body and on the coat of rabbits, g. pig and mice. On canaries only Gram-negative rods we found. In human beings, coliform organisms are n consistently found on the skin and when rubbed on the skin die off, perhaps on account of the staphylococ resident there.

Broth-moistened swabs were taken from vario parts of the skin of newborn children and put on ag and blood-agar plates. There was no difference skin flora of the day-old infant from that of the adu As the skin of the infant becomes contaminated at bir by the vaginal flora of the mother, N. investigated t skin flora of infants delivered by Caesarean sectio Four such babies were examined 15 min. after t operation (before or after the first bath). The plat were mostly sterile. One hour after the operation the were 10–20 colonies of white staphylococci. In cases examined the day after the operation the sk proved rich in white staphylococci. Staphylococci, b not other bacteria, increased in numbers on the sk as the infant grew.—D. L. ROBARTS.

YOUNG, E. G., & HAWKINS, W. W. (1944). **T decomposition of allantoin by intestinal bacteria.** *J. Bact.* **47.** 351–353. [Authors' summary copi *verbatim*]. **4**

Allantoin in nutrient broth was decomposed *Escherichia coli*, *Aerobacter aerogenes* and *Prote vulgaris*. This reaction was shown to a very slig extent or not at all by cultures of *Bacillus mesenteric Lactobacillus bulgaricus*, *Streptococcus fecalis* and *hemolyticus* and *Staphylococcus aureus*.

FOSTER, J. W. (1944). **Microbiological aspects riboflavin. III. Oxidation studies with** *Pseudomon riboflavina*.—*J. Bact.* **48.** 97–111. [Author's sur mary copied *verbatim*]. **4**

Pseudomonas riboflavina attacks ribose, but different enzyme systems from those with which attacks the ribityl group of riboflavin. Lumiflav apparently is not attacked. Ribityl groups of a numb of other riboflavin homologues and related compoun are also attacked. Some, like 4,5-dimethyl-phen isoalloxazine, inhibit riboflavin oxidation by t organism. This action is not competitive since

cannot be reversed by higher concentrations of riboflavin and it inhibits oxidation of glucose by the *P. riboflavina* and other bacteria also. It has no anti-vitamin activity in rats.

See also absts. **516, 612, 642, 643** (staphylococci), **611, 640** (mastitis), **514, 515, 613, 647, 677** (TB.), **668** (calf scours in Nigeria), **555** (pasteurella), **521** (salmonella) **556** (pullorum disease), **614, 638** (brucella), **519, 555** (clostridia), **517, 518** (tetanus), **615** (ringworm in horses), **603-608** (antibacterial agents).

DISEASES CAUSED BY PROTOZOAN PARASITES

I. WADDINGTON, F. G. (1944). **Lesser-known lesions of diagnostic value in bovine trypanosomiasis. [Correspondence].**—*Vet. Rec.* **56.** 289–290. [See also *V. B.* **14.** 298, absts. 1900 & 1901]. **481**

II. CRAWSHAW, H. A. (1944). **Lesser-known lesions of diagnostic value in bovine trypanosomiasis. [Correspondence].**—*Ibid.* 455. **482**

I. W. explains that in describing lesions his suggestion [*V. B.* **14.** 298.] that they might be due to the specific action of trypanosomes was only tentative, but contends that even if the loss of the tail brush is secondary and due to the poor circulation, it should be included to complete the clinical picture. He does not admit that the tongue ulceration is a "grass ulcer", and claims that natives consider it a good guide to trypanosomiasis, but admits that it may also be a secondary lesion due to anaemia.

II. C., in "mouthing" approximately 2,000 healthy cattle for export from Bechuanaland, found that "grass ulcers" were comparatively common, and occurred almost exclusively at the site mentioned by W. He suggests that their acceptance as an indication of trypanosomiasis is due to failure to examine the mouths of healthy cattle. No marked loss of hair of the tail has been noted in trypanosome-affected cattle in Ngamiland, but a degree of dermatitis of the end of the tail may occur.—U. F. RICHARDSON.

SIMPSON, M. L. (1944). **Exoerythrocytic stages of *Plasmodium durae*.**—*J. Parasit.* **30.** 177–178. **483**

Two turkeys were inoculated intravenously with blood obtained by heart puncture from a duck infected with *P. durae*. Both turkeys remained infected until their deaths. One turkey died after 26 days, and smears made from spleen, liver, lungs, and brain all showed exo-erythrocytic stages of *P. durae*. The other turkey was killed after 78 days and smears of spleen, liver, lungs, and brain showed no typical exo-erythrocytic stages. Eight young (5–10 days old) turkeys were inoculated intravenously with *P. durae*. Two of these were found to have exo-erythrocytic stages in the spleen, liver, lungs, and brain. Of the ten birds reported on, six died as a result of experimental infection, and four were killed at various intervals after the original infection. Exo-erythrocytic stages were found in three of the six birds which died of the infection, but not in any of those which were killed.—C. HORTON SMITH.

WILSON, S. G. (1944). **Theileriasis in cattle in Northern Province, Nyasaland.**—*Vet. Rec.* **56.** 255–258. **484**

In Nyasaland, major epizootic diseases are absent and bacterial diseases of stock are of minor importance. The indigenous cattle are largely immune to redwater, anaplasmosis, and heartwater, but East Coast fever occurs in the Northern Province and the veterinary staff there are mainly concerned with the control of theilerial infections.

East Coast fever was recorded in Mzimba district in 1912, but is believed to have been introduced much earlier. Dipping at intervals of 5–7 days has been introduced into five of the six districts of the province, and records are kept of the number of cattle owned, number of calves born, number of deaths, and number of animals stolen or missing; when deaths occur, spleen smears are required within 12 hours. If the smears show Koch's bodies, the deaths are ascribed to East Coast fever.

Deaths are most numerous during the summer rains, from December to March, and correspond to the time of the greatest prevalence of adult ticks of the species *Rhipicephalus appendiculatus*, which appear to acquire the infection in the nymphal stage, and to transmit it as the adult. The worst month for deaths is March, but even then the mortality only reaches 1–5%; this is low as compared with mortality in other areas.

Indigenous cattle contract infection as calves, and the disease may be unnoticed, but in some local cattle and in imported stock, fatal cases occur with high fever, ulceration of the abomasum, kidney haemorrhages, and, more rarely, white infarcts and numerous Koch's bodies. The various age groups seem equally affected with the acute form, and as many calves die as adults. There is no evidence that the chronic form, turning sickness, as recorded in East Africa, occurs in Nyasaland.

The question is discussed whether the deaths are due to a chronic disease similar to *Theileria mutans* infection aggravated by weather conditions, or to a mild strain of East Coast fever, and it is pointed out that there is little to distinguish *T. mutans* and *T. parva* except the severity of the disease they produce, and the more numerous Koch's bodies occurring in *T. parva* infections.—U. F. RICHARDSON.

LWOFF, M., & CHORINE, V. (1943). Influence de l'acide ascorbique sur la culture de *Spirochaeta gallinarum*. **[Influence of ascorbic acid on cultivation of *S. gallinarum*].**—*Ann. Inst. Pasteur.* **69.** 158–161. **485**

S. gallinarum grew well in an oil-covered medium consisting of five parts of 0·5% peptone, one part of fresh rabbit serum, and 0·6 part of fresh g. pig serum. Abundant growth was obtained after 4–5 days' incubation at 28°–29°C. Washed, haemolysed g. pig red blood cells could replace the g. pig blood in the medium, but g. pig serum was useless. The important constituent of the r.b.c. appeared to be ascorbic acid, and a 1 : 12,000 concentration of this factor permitted good growth in a peptone + rabbit-serum medium. In this case, growth was as good without as with the partial anaerobic conditions imposed by the oil seal. The ascorbic acid could not be replaced by cysteine. It is suggested that the ascorbic acid acts as a growth factor and not by its effect on the oxidation-reduction potential of the medium.—J. LOCHIEL MCGIRR.

See also absts. **616** (trypanosomiasis), **617** (avian coccidiosis), **618, 666** (bovine piroplasmosis), **667** (protozoan diseases in N. Rhodesia), **670, 672** (in Uganda), **524** (in the U.S.A., **525** (in Venezuela), **556** (of poultry).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

SANDERS, M., & HUANG, C. H. (1944). **Tissue cultures for virus investigations in the field.**—*Amer. J. publ. Hlth.* **34.** 461–466. **486**

The authors have devised a method for the application of laboratory methods to field studies in virus diseases. The medium used consists of a small amount

of minced chick-embryo tissue in an ultrafiltrate of ox serum (protein free) contained in rubber-stoppered tubes. Most of the experiments were undertaken with the virus of equine encephalomyelitis and were designed to test (a) the viability of the tissues under varying conditions of temperature, pH etc., and (b) the relation of persistence of virus with viable cells.

It was found that at 37°C., cells remained alive for four weeks, at 25°C. for 35 days, and at 4°–6°C. for three weeks. Propagation of the virus was, in every case, closely correlated with tissue viability.

The effect was also studied of adding a bacteriostatic agent such as sulphadiazine, since material taken in the field may be contaminated with bacteria. Concentrations of 50–85 mg.% had a slightly inhibitory effect on tissues but did not prevent virus growth even after 35 days at room temperature.—R. E. GLOVER.

I. *SCHOLL, O. K. (1943). Über zwei Fälle von Maul- und Klauenseuche beim Menschen und ihre Behandlung mit Eleudron. [**Treatment of two cases of foot and mouth disease in human beings with "eleudron"**].—*Münch. med. Wschr.* pp. 71–72. [Abst. from abst. in *Jber. Vet.-Med.* **71.** 127]. **487**

II. *BICHLMAYR, A. (1943). Zur "Maul- und Klauenseuche" beim Menschen. (Zugleich zur Arbeit von Dr. Scholl "Über zwei Fälle von Maul- und Klauenseuche beim Menschen und ihre Behandlung mit Eleudron" in ds. Wschr. 1943, Nr. 4, S. 71 und Prof. Specht, "Bemerkungen zur Maul- und Klauenseuche beim Menschen", in ds. Wschr. 1943, Nr. 9, S. 168). [**Foot and mouth disease in human beings**].—*Ibid.* p. 359. [Abst. from abst. in *Zbl. Bakt. I. (Ref.).* **144.** 341]. **488**

III. *RÖHRER, H. (1943). Über zwei Fälle von Maul- und Klauenseuche beim Menschen und ihre Behandlung mit Eleudron. (Bemerkungen zur gleichnamigen Arbeit von Oberstabsarzt d. R. Dr. Otto Conrad Scholl in ds. Wschr. 1943, Nr. 4, S. 71.) [**Two cases of foot and mouth disease in human beings and their treatment with "eleudron"**].—*Ibid.* pp. 359–360. [Abst. from abst. in *Zbl. Bakt. I. (Ref.).* **144.** 342]. **489**

I. Two cases of acute conditions in soldiers were considered to be F. & M. disease; the diagnosis was not confirmed by biological test. Both were treated with "eleudron", astonishingly good results being claimed following intravenous injection.

II. Two cases of F. & M. disease recorded by SCHOLL [see I] are described; they closely resembled the disease as seen in affected animals. No biological test was used to confirm the diagnosis.

III. In R.'s opinion, SCHOLL's two cases were not cases of F. & M. disease, as the description does not correspond with that of authenticated cases in man and the diagnosis was not confirmed by biological test. Because of the extremely low susceptibility of man to the virus of F. & M. disease, the greatest caution is necessary in making a diagnosis; it must be confirmed either by the demonstration of the presence of virus by the intradermal inoculation of g. pigs or by the demonstration of neutralizing antibodies in the patient's serum.—W. M. HENDERSON.

REMLINGER, P., & BAILLY, J. (1943). Action de la protéolyse sur la virulence de la substance nerveuse rabique. [**Action of proteolysis on the virulence of rabies nervous tissue**].—*Ann. Inst. Pasteur.* **69.** 135–138. **490**

The period during which an emulsion of rabies fixed virus derived from the brains of infected mice retained its virulence was increased fourfold (from two to eight days) by the addition of ascorbic acid (one part vitamin to 1,000 emulsion). The loss of virulenc which normally occurs in such emulsions is said to b due to the action of proteolytic enzymes and, unde the conditions of the experiment (exclusion of oxyge and light, pH 6·8, precautions against the presence c traces of copper, and temperature 21°–24°C.), th vitamin is believed to have inhibited their activity.

—J. LOCHIEL MCGIRI

I & II. BURNET, F. M. (1942). **Influenza virus B I. Observations on growth in chick embryos and o the occurrence of antibodies in Australian serum II. Immunization of human volunteers with livin attenuated virus.**—*Med. J. Aust.* June 20th. 671 673 & 673–674. **49**

III. BURNET, F. M. (1943). **Immunization agains epidemic influenza with living attenuated virus.**— *Ibid.* May 1st. 385–389. **49**

IV. BULL, D. R., & BURNET, F. M. (1943). **Exper mental immunization of volunteers against influenz virus B.**—*Ibid.* 389–394. **49**

V. MAWSON, J., & SWAN, C. (1943). **Intranasa vaccination of humans with living attenuated influ enza virus strains.**—*Ibid.* 394–399. **49**

I. At the date of writing, influenza B had no been recognized in Australia. Neutralization test however (amniotic inoculation, mouse inoculatior Hirst's haemagglutination technique), on human serur samples in Australia indicated that influenza B infectior had occurred, at least as early as November, 1938.

II. Living influenza virus B adapted to chick embryo passage was administered intranasally by mear of an atomizer to volunteer subjects. Subjects wh initially showed a very low level of antibody (Hir titration) responded with a significant increase in ant body level. Only trivial symptoms or none at all wer observed. It was considered that the method migh provide a useful means of immunization.

III. Three strains of influenza virus A and or of B were used in the form of amniotic fluids of infecte chick embryos in order to vaccinate human volunteer by the method referred to in II. For each type of viru from 68–80% of the subjects showed no significar change in antibody level; 20–32% showed rises, pa ticularly those with lower initial levels. B. relates th to the fact that even in the pandemic of 1918 abo 70% of the population escaped clinical infection, and l considers it to be expected that only 30–50% of subjec would show a definite rise in antibody against any or type of vaccine. Reference is also made in this pap to various aspects of research on influenza virus mac by members of the Hall Institute; most of this wo has been published.

IV. Atomized influenza virus B (40th amniot passage) was introduced intranasally to 23 volunte with initial low antibody content (Hirst's metho The virus was demonstrable in the nose two days late Serum samples taken three weeks later showed significant rise of antibody in 21 subjects. Wh reinoculated 11–24 weeks later, there was a significa rise in the serum of only two of the volunteers. Th is considered to be demonstration that the first inocul tion engendered a state of resistance. There was greater proportion of minor symptoms after the secor than after the first inoculation. It is considered th allergic factors may play a part in producing symptom

V. Although susceptibility to influenza is mo common if antibody level is low, infection frequent occurs even with a high antibody level. Therefo other factors besides antibody level are importa including general and local resistance. In the hope augmenting local resistance, the authors used intrana inoculation of atomized 40th-passage viruses A and

on 100 volunteers. When tested 14 days later, their sera showed an average twofold increase in antibody, with a range from nil to 27-fold. It is suggested that unless all the non-reactors are immune, they may be a source of danger in a community in which large-scale vaccination is relied upon in an epidemic. Repeated vaccination failed to raise the antibody levels in these subjects. It is suggested that these cases may fall into the 50–90% of resistant subjects and that subjects who do react are those who would normally be susceptible to influenza.—A. W. TURNER (AUSTRALIA).

BURNET, F. M., & BEVERIDGE, W. I. B. (1943). **Titration of antibody against influenza viruses by allantoic inoculation of the developing chick embryo.**—*Aust. J. exp. Biol. med. Sci.* **21.** 71–77. **495**

If chick embryos 10–12 days old are inoculated into the allantoic cavity with influenza virus, a few drops of allantoic fluid collected three days later agglutinate fowl red cells, whereas uninfected allantoic fluid does not. This is the principle of the method described which is applied to titration of influenza A virus or of antibody, which has been applied equally to influenza B [see abst. 493 above], and which probably is applicable to any virus which multiplies freely in the allantoic cavity and has active haemagglutinating properties. Influenza antibody titration by this method appears to be well correlated with resistance to natural influenza and, for this reason, it is suggested that the technique may be of more practical value than the existing methods (protection of ferrets against intranasal infection, intranasal titration on mice, complement-fixation, titration on the chorio-allantois against egg-adapted virus, and Hirst's method using fowl cell agglutination). When this technique was used, it was found that 18 out of 19 susceptible persons, after developing natural influenza, showed a very large "allantoic antibody" rise from a very low pre-infection level. Among 36 unselected persons, nine showed moderate to high amounts of antibody. Applications of the method to the titration of swine influenza antibodies and to the rise of influenza B antibody after intranasal inoculation are described. Following influenza A infection, the antibody rise against the homologous subtype was not evident when the tests were made against another subtype. The authors consider that antibody measured by this method gives the best indication of resistance which has yet been developed.—A. W. TURNER (AUSTRALIA).

BURNET, F. M. (1943). **Upper respiratory tract infection.**—*Med. J. Aust.* Nov. 13th. 393–398. **496**

A review article dealing mainly with influenza. Experimental and serological techniques are described, known differences between types A and B virus being pointed out. Recent experiences with influenza are mentioned, but the main part of the paper comprises a discussion of the pathogenesis of influenza and of the problems to be faced in the control of a pandemic similar to that of 1918–1919.

—D. FORSYTH STEWART (AUSTRALIA)

BEVERIDGE, W. I. B., & BURNET, F. M. (1944). **A cutaneous reaction to the influenza viruses.**—*Med. J. Aust.* Jan. 29th. 85–89. **497**

Intradermal inoculation of allantoic fluid infected with type A or type B influenza virus, diluted 1 : 10 in saline and boiled for 10 min., produced erythematous reactions in most adults and in some children. 10–20% of adults also reacted to a similar preparation of Newcastle disease virus, but very few children reacted. Normal allantoic fluid and suspensions of chick tissue did not produce reactions. In adults the extent of the reaction bore no correlation to the serum antibody titre. All but one of 18 reactors amongst 31 children were shown to have circulating antibody, but many with circulating antibody showed no skin reactivity. It is suggested that the reaction is of an allergic nature and that the allergic state of the subject may play a part both in resistance and in the production of symptoms.

—D. FORSYTH STEWART (AUSTRALIA).

I. TWYBLE, E., & MASON, H. C. (1944). **Hemagglutination by products of influenzal virus using infected mouse-lung and chick-embryo as the source of virus.**—*J. Immunol.* **49.** 73–85. **498**

II. SALK, J. E. (1944). **A simplified procedure for titrating hemagglutinating capacity of influenza-virus and the corresponding antibody.**—*Ibid.* 87–98. **499**

I. Influenza virus suspensions from mouse lung and allantoic fluid respectively were used for studies on the Hirst haemagglutination test. No appreciable differences in the agglutination or serum-inhibiting reactions were observed between mouse and chick-embryo virus suspensions. Pigeon and human red cells gave the lowest agglutination titres. Variations were sometimes encountered with cells of individual chicks [see STUART-HARRIS—*V. B.* **13.** 424.], but were usually insignificant if pooled blood from adult fowls was used. Red cells of different origin (human, chick, g. pig, etc.) were equally suitable since similar end results were obtained when the same immune sera were used.

Filtration of virus suspensions through Seitz pads and Berkefeld candles failed to separate the agglutinins from the infective particles.

II. A simplified method is described for titrating haemagglutinins, involving a reduction in the quantity of red cells. Serial twofold dilutions of virus are added to equal parts of 0·25 ml. of a chick-cell suspension in small tubes with round bottoms. After agglutination has taken place, maximum aggregation is shown by a uniform salmon-pink film covering the entire bottom of the tube, whilst a negative reaction is represented by a central, sharply demarcated disc. Transition from complete agglutination to no reaction is usually rather abrupt. The results are read in a special viewing box which is described in detail.

Inhibition by immune serum is recorded in a similar manner. The advantages of considering the pattern of agglutination, rather than a specific time interval, as advocated by Hirst, are discussed. The desirability of a uniform standard of expression of results is also considered.—R. E. GLOVER.

KNIGHT, C. A. (1944). **Titration of influenza virus in chick embryos.**—*J. exp. Med.* **79.** 487–495. [Author's summary copied *verbatim*]. **500**

A study was made to establish the reproducibility of end points obtained in the titration of influenza viruses in chick embryos. Six tests were performed, each composed of five replicate titrations of a purified preparation of the PR8 strain of influenza virus. The data from these titrations were subjected to statistical analysis which revealed that the chances are 19 out of 20 that differences in end points of 0·37 and 0·62 logarithmic units are significant in titrations employing ten embryos and five embryos per dilution, respectively. Additional simultaneous titrations in embryos and in mice showed that chick embryos are sensitive to considerably smaller amounts of virus than are mice, and that the mouse titration is adversely affected by inactive virus under conditions which are without apparent influence on the embryo titration.

HOLZ, K. (1944). Zur postmortalen Differentialdiagnose der ansteckenden Blutarmut des Pferdes. **[P.M. diagnosis of equine infectious anaemia].**—*Z. InfektKr. Haustiere.* **60.** 287–295. **501**

In chronic cases of E.I.A., haemosiderin is found to be deposited in the stellate cells of the liver sinusoids, and there is generally a diminution in the amount of haemosiderin in the spleen. H. studied the distribution of haemosiderin in the liver, spleen, and kidneys of a number of cattle, horses, sheep, and pigs which were affected with suppurative or toxaemic conditions. The pigment was found to be present in over half the animals in the liver; it was sometimes seen in the stellate cells, but more often, and especially in calves, in the liver cells themselves, and there was no accompanying diminution in the amount of haemosiderin in the spleen. It is suggested that there may be significant differences in the site of haemosiderin deposition in the liver of the horse in infectious anaemia and secondary anaemia, which may serve as a useful means of differential diagnosis.—E. COTCHIN.

PIROG, P. P., & VORONTSOV, S. M. (1941). O tsennosti patologo-gistologicheskovo metoda pri diagnostike infektsionnoĭ anemii loshadeĭ. **[The value of pathological and histological diagnosis in equine infectious anaemia].**—*Trud. XV Plen. vet. Sekt. Akad. sel'khoz. Nauk, Moscow, 1939.* [*Diseases of Horses*]. pp. 23–27. **502**

The authors examined P.M. 329 naturally and 125 experimentally infected horses and foals. They consider that diagnosis cannot be based on the results of pathological and histological findings, as the changes found occur also in other conditions, but that these findings are nevertheless of great importance for the final diagnosis. The most typical changes in E.I.A. were proliferation of reticulo-endothelial cells, deposition of haemosiderin in the r.e. cells, and hyperplasia of lymphoid cells in the spleen. The necessity is emphasized for histological examination not only of the liver and spleen but also of the kidneys, heart, and lungs. —A. MOLDAWSKY.

NIGG, C., & EATON, M. D. (1944). **Isolation from normal mice of a pneumotropic virus which forms elementary bodies.**—*J. exp. Med.* **79.** 497–510. [Authors' summary copied *verbatim*]. **503**

1. A pneumotropic virus which forms elementary bodies has been isolated from apparently normal albino Swiss mice.

2. The antigenic relationship of this virus to those of meningopneumonitis, lymphogranuloma venereum, hamster pneumonia, and human pneumonitis was established either by cross-immunity or complement fixation or both.

3. In spite of a relationship to other viruses, the virus could be differentiated from all the others studied by certain of its properties.

LASTRA, T. DE V., BABINI, D. S., CASFER, V., & SEGUES, P. L. (1942). Consideraciones sobre tres casos de psitacosis. **[Three cases of psittacosis].**—*1er. Congr. nac. Enferm. endem.-epidem., B. Aires, 1942.* pp. 597–599. **504**

Altogether five cases of psittacosis in man are referred to. Two occurred on premises where parrots, canaries, thrushes, and other birds were kept. The remaining three cases, treated by the authors, were contacts with the first human cases. The parrots were the only birds which showed any signs of disease; some were affected with diarrhoea, and deaths occurred daily.

Diagnosis of the human cases was confirmed by the complement-fixation test.—I. W. BROCKLEHURST.

BOURDILLON, J. (1944). **Purification, sedimentation, and serological reactions of the murine strain of SK poliomyelitis virus.**—*Arch. Biochem.* **3.** 285–297. **505**

B. describes a method for the extraction of SK poliomyelitis virus from infected mouse brains. The principle of the method is the acid precipitation of the brain proteins followed by the elution of the precipitate in neutral buffer. (Details are given of the technique used to obtain this purified virus preparation.) Sedimentation studies in the ultracentrifuge gave rates of 60–130S [? means $S_{20} = 60–130 \times 10^{-13}$]. The molecular weight of the virus is probably about 10 million. The increase in sedimentation rate following dilution suggests that the virus molecules are elongated, so that the virus particles may be thread- or rod-like.

The purified virus preparation gave positive precipitin reactions with sera from convalescent human beings and animals. Similar results were obtained with sera from rabbits immunized with infected mouse brains, and doubtful or negative results with sera from rabbits inoculated with normal mouse brains.—D. L. HUGHES.

BOURDILLON, J. (1944). **Heat inactivation of the murine strain of SK poliomyelitis virus.**—*Arch. Biochem.* **3.** 299–303. [Author's summary copied *verbatim*]. **506**

The rate of thermal inactivation of unpurified and partially purified SK murine poliomyelitis virus has been determined at 49·5°C. and 56·5°C. The energy of activation of the reaction was of the order of 100,000 calories per mole.

TOOMEY, J. A., FROHRING, W. O., & TAKACS, W. S. (1944). **Vitamin B_1 deficient animals and poliomyelitis.**—*Yale J. Biol. Med.* **16.** 477–485. [Authors' conclusions copied *verbatim*]. **507**

1. Attempts to acclimate the Flexner M.V. strain of poliomyelitis virus to white rats by making them vitamin B_1 deficient or by over-feeding them with vitamin B_1 were unsuccessful.

2. When white mice were the test animals and the Lansing poliomyelitis virus (cotton-rat strain) was the test inoculum, there were more obvious paralytics in a vitamin B_1 over-fed group than in a vitamin B_1 deficient group in the first transfer generation. When a second transfer generation was made with cords of mice that died without paralysis in the first generation, there was no significant difference in the total number of animals paralyzed in the vitamin B_1 over-fed and the vitamin B_1 deficient animals.

3. Paralysis developed more quickly in the normally fed white mice than in the animals fed a diet deficient in vitamin B_1 and in those given a supplemental dose of the vitamin. This point was not conclusive, however, since some animals of the deficiently fed group that died during the incubation period of paralysis might also have carried the virus.

DERRICK, E. H., SMITH, D. J. W., & BROWN, H. E. (1942). **Studies in the epidemiology of Q fever. 9. The role of the cow in the transmission of human infection.**—*Aust. J. exp. Biol. med. Sci.* **20.** 105–110. [For part 8, see *V. B.* **12.** 586]. **508**

In further studies on the epidemiology of "Q" fever, it has been found that cattle infected with *Rickettsia burneti* develop a brief, mild, febrile illness and that the tick *Boophilus annulatus microplus* can acquire the infection from such cattle and excrete the rickettsia in its faeces. Further evidence incriminating cattle as being concerned in the transmission of "Q" fever is the occupational incidence of the disease and the occurrence of agglutinins for *R. burneti* in cows in the endemic areas. It is considered likely that cows become infected from the animal reservoir by means of ticks other than *B. annulatus microplus* and that they can then transmit the disease to man either directly from their tissues or indirectly from the crushed tissues or the faeces of the ticks.—A. W. TURNER (AUSTRALIA).

NICOLLE, P. (1943). Sur une cause importante d'erreur dans la titrage d'un bactériophage. Cas des suspensions bacteriennes non homogènes. [**Non-homogeneous suspensions of bacteria an important cause of error in the titration of bacteriophage**].—*Ann. Inst. Pasteur.* **69.** 13–16. **509**

The technique used for the titration of bacteriophage was by mixing the susceptible bacterial suspension with a weak solution of the corresponding phage, spreading on solid medium, incubating, and counting the plaques produced. Errors arose from two causes, *viz*, uneven distribution in the suspension and formation of clumps of variable numbers of bacteria. In neither case was the error systematic. Error was avoided by first flooding the solid medium with the weak bacteriophage suspension, followed 15 min. later by the susceptible bacterial suspension. This method was suitable for *Bacillus subtilis*, which is difficult to homogenize. Shaking of the bacterial culture is important in avoiding the second type of error, but the phage should be shaken for a fixed time with the suspension before transfer to the solid medium, if this method is to be used.

For plating out the phage, the use of a " spreader " is unnecessary, but for the bacteria it is very desirable. —R. M. ARNOLD.

See also absts. **667** (virus diseases in N. Rhodesia), **676** (of sheep in Cyprus), **555** (E.E.), **620** (influenza), **619** (bovine malignant catarrh), **667** (bovine contagious pleuro-pneumonia and F. & M. disease—immunization), **671** (rinderpest in Uganda), **667**, **676** (blue tongue), **667** (sweating sickness in calves), **563** (S. F. and syncope), **556** (poultry viruses), **680** (avian leucosis complex), **554** (rabbit papilloma), **440** (bacteriophage), **510**, **511** (virus formation), **446** (poliomyelitis virus from neurotropic streptococci).

IMMUNITY

I. *JORDAN, P. (1941). Ueber die Spezifität von Antikörpern, Fermenten, Viren, Genen. [**The specificity of antibodies, ferments, viruses, and genes**].—*Naturwissenschaften.* **29.** 89–100. **510**

II. *NEUGEBAUER, T. (1942). Ueber die autokatalytische Entstehung der Viren und verwandte Probleme. [**The role of autocatalysis in the origin of viruses**].—*Ibid.* **30.** 168. **511**

[Absts from absts. in *Bull. Inst. Pasteur.* **41.** 197 & 205].

I. J. propounds a theory of antibody formation based partly on the tenets of classical immunology and partly on the conception that the multiplication of viruses (and of genes) is an autocatalytic phenomenon, and he attempts to justify it by theoretical reasoning. He starts with the case of passive anaphylaxis and assumes that, when the serum of a sensitized animal is injected into another of the same species, the injected antibodies multiply. This reasoning implies that the injected antibodies behave like antigens in the sense that they evoke antibody formation, but, contrary to normal immune reactions, the antibodies produced are identical with the product injected (*i.e.* the antibodies of the sensitized animal).

The fact that minute amounts of antigen are capable of eliciting the formation of large amounts of antibody is utilized by J. to justify the application of this idea to antibody formation in general. He postulates that when antigen is injected it undergoes partial enzymatic degradation and that the specific portion of the antigen molecule is utilized in the synthesis of a globulin which possesses the attribute of autocatalytic multiplication. If the organism does not possess the necessary primary materials to synthesize particular specific groups corresponding to those of the injected antigen (*e.g.* arsenical groups in the antigen molecule), it is said to manufacture antibody molecules with a structure at variance with that initially formed, but with a configuration sufficiently close to the original antibody to allow of specific combination with the antigen.

By similar reasoning, J. purports to explain allergic phenomena, the formation of Abderhalden's defensive ferments, Prigge's observations on the statistics of immunization, etc. In the final section an attempt is made to justify the autocatalytic theory of protein and, in particular, of virus multiplication.

[The primary conceptions upon which this theory is based appear to be open to serious criticism and the French abstractor comments on the fact that J. finds difficulty in giving a plausible explanation of the autocatalytic theory in terms of modern physico-chemical knowledge.]

II. Basing his arguments on modern physico-chemical knowledge concerning the structure of proteins and cellular protoplasm, N. disagrees with JORDAN'S theory [see I] of the genesis of viruses and, in general, criticizes attempts to explain the transformation of cellular proteins into virus proteins in terms of autocatalysis. In general, this criticism is based on the fact that the coiled state of protein polypeptide chains inside the cells opposes the action of the van der Waals forces which, according to the autocatalysis theories, bring about the transformation of host cellular proteins into parasitic virus proteins.—J. LOCHIEL MCGIRR.

MRUGOWSKY, J. (1942). Zur Frage der zellulären Immunität beim Menschen nach peroraler Immunisierung. [**Cellular immunity in human beings after peroral immunization**].—*Z. ImmunForsch.* **102.** 153–164. **512**

Oral administration of a typhoid-paratyphoid antigen (" typhoral " pills) on three successive days was followed by a slight increase in agglutination titre for typhoid and paratyphoid and a considerably greater rise in the titre for dysentery bacilli (1 : 200–1 : 800). The appearance of agglutinins to dysentery bacilli is explained on the basis that the persons had previously suffered from this disease and the nonspecific stimulus of the typhoid-paratyphoid vaccine caused the sudden release of dysentery bacilli antibodies from the body cells. Oral doses of a dysentery antigen (" dysperos " : lysed polyvalent dysentery culture) produced no rise in the titre of dysentery agglutinins. Rectal administration of " typhoral " capsules had no effect on the agglutinin titre.

In an area where dysentery was common among the troops, M. administered oral vaccines, one tablet being given on each of three successive days. " Ruhrorovakzine " was given to 3,751 troops in camp A and " dysperos " to 3,662 troops in camp B. Dysentery had previously been very widespread and a special laboratory had been set up to deal with the problem. During the nine months following the administration of the vaccine only occasional cases of dysentery or other diarrhoeic conditions were encountered, and there were no outbreaks of the disease in either camp.

Attempts to assess the degree of cellular immunity to typhoid by intracutaneous injection of the endotoxin of the organisms were unsuccessful.—E. G. WHITE.

—. (1944). **Multiple antigens for active immunization.**—*Amer. J. publ. Hlth.* **34.** 452–454. **513**

A subcommittee of the Committee on Administrative Practice, American Public Health Association, created to study the effects of combined antigens in

children and adults, has issued a cautious recommendation that under special circumstances a combination of antigens may be advisable. The need is stressed for careful preliminary trials as to the influence of a multiplicity of antigens on the potency of each component. The detailed findings should be consulted in the original.—R. E. GLOVER.

RODRIQUEZ LOUSTAU, J. A., & STURA, C. A. (1943). A propósito de la anafilaxia pasiva en el reconocimiento de las carnes tuberculosas. [**Passive anaphylaxis in the detection of TB. in carcasses**].—*Bol. tec. Direcc. gen. Agric. Ganad., B. Aires.* Secc. Ganad. No. 9. 600–604. **514**

The authors attempted to produce a state of specific hypersensitivity to TB. by the intraperitoneal injection of rabbits with macerated muscle tissue taken from the region of tubercular lesions in the bovine carcass. Material from 80 tubercular carcasses and 30 healthy carcasses was used, but in no case did the provoking dose of bovine tuberculin produce any evidence of anaphylactic shock. The conclusion, therefore, is that, under the experimental conditions adopted, passive anaphylaxis could not be used for the detection of TB. in bovine carcasses.—I. W. B.

HEILMAN, D. H., FELDMAN, W. H., & MANN, F. C. (1944). **Specific cytotoxic action of tuberculin. Quantitative studies on tissue cultures.**—*Amer. Rev. Tuberc.* **50.** 344–356. **515**

The effect of tuberculin on normal and tuberculous tissues was studied by adding suitable dilutions to explants of spleen, lymph nodes, or leucocytes from tuberculous and normal rabbits respectively. The strain of *Mycobacterium tuberculosis* used to infect the rabbits was of relatively low virulence. Quantitative determinations of the extent of cellular migration were made from which a comparative cytotoxic index could be ascertained. The results showed quite clearly that wandering cells and fibroblasts derived from tuberculous animals were inhibited in their growth and migration by tuberculin, the effect being more marked on leucocytes than on lymphocytes. Contrary to the report by MOEN & SWIFT [*V. B.* **7.** 390.], macrophages from tuberculous animals migrated further in normal medium than the corresponding cells from normal animals.—R. E. GLOVER.

LIGHTY, J. A., Jr., & KATSAMPES, C. P. (1943). **A method for the determination of staphylococcal antitoxin and anticapsular agglutinin using capillary blood.**—*J. Lab. clin. Med.* **28.** 1258–1261. **516**

A volume of capillary blood as small as 0·05 ml. was used for the simultaneous titration of staphylococcal antitoxin and anticapsular agglutinin. Control tests using the standard procedure proved the test reliable. There was an indication, however, that both staphylococcal antitoxin and agglutinin are more concentrated in capillary than in venous serum.—D. L. ROBARTS.

PETRIE, G. F. (1942–43). **Observations on the variable interactions of tetanus toxins and antitoxins.**—*Bull. Hlth Org. L.o.N.* **10.** 113–143. **517**

A number of glycerinated test-toxins all prepared from a single strain in the same medium were used to evaluate selected antitoxins. Mice and g. pigs were used as test animals. Some of the test toxins were "short growth" (4 days) and others were "long growth" (12–21 days). A factor which greatly influenced the results of the tests was whether the toxin and antitoxin were homologous, *i.e.*, from the same culture filtrate, or heterologous, *i.e.*, from different filtrates. Discrepant results in a prolonged series of tests suggested that by immunological standards, tetanus toxin is not a homogeneous substance. It was also concluded that tetanus antitoxin is complex, especially when it is the response to a "long-growth" toxin. Such toxins are regarded as a mixture of the primary toxin molecules and an antigenic variant of this probably produced by denaturation. P. considers that biophysical methods could profitably be applied in the study of the complexity of tetanus antitoxins.—J. KEPPIE.

SMITH, M. L. (1942–43). **Note on the complexity of tetanus toxin.**—*Bull. Hlth Org. L.o.N.* **10.** 104–112. **518**

The lethal doses of several samples of tetanus toxin were tested in mice, g. pigs, and rabbits in order to determine the relative toxicity of each toxin in the different test animals. The toxins had been produced under widely different conditions and they were selected also because they differed in other characters such as their combining properties, toxoid content, and immunizing efficiency. The toxicities were calculated on the basis of lethal dose per 100 g. body weight. It was shown that whereas the mouse : g. pig ratio was approximately constant for all of the toxins, the mouse : rabbit ratios differed by as much as 150-fold, according to which toxin was used.

It was concluded that the toxins contained varying amounts of two or more toxic factors and that mice and g. pigs were relatively more susceptible to one factor, while rabbits were susceptible to the other. The variation in the mouse : rabbit ratio could not be attributed to the culture medium, the growth period, the strain or type, the content of toxoid, or to any other property of the toxins. Two of the toxins were used to immunize rabbits, but when the resulting antitoxins were used for neutralization tests in animals, no differences were revealed.—J. KEPPIE.

HARTLEY, P., & EVANS, D. G. (1942–43). **Standard preparations for the assay of the three gas-gangrene antitoxins,** *Cl. perfringens, Cl. vibrion septique* **and** *Cl. oedematiens.*—*Bull. Hlth Org. L.o.N.* **10.** 97–103. **519**

Antitoxins of *Clostridium welchii, Cl. septicum,* and *Cl. oedematiens* had to be selected which most nearly resembled the former international standard preparations in character. The chosen antitoxins were accurately distributed in 5 ml. amounts into ampoules and then rapidly desiccated. These dry, stable preparations were kept in cold storage until required, when they were dissolved in an appropriate volume of 66% glycerol-saline. The potency of each new standard preparation was carefully checked against the former international standard in several laboratories, both mice and g. pigs being used.—J. KEPPIE.

HERSHEY, A. D. (1944). **Specific precipitation. VI. The restricted system bivalent antigen, bivalent antibody, as an example of reversible bifunctional polymerization.**—*J. Immunol.* **48.** 381–401. [For previous parts, see *V. B.* **14.** 91]. **520**

A detailed description of the equilibrium reached by the polymerization of bivalent antigen with bivalent antibody is formulated for the limiting case in which reactions are restricted to the formation of open linear chains through the sole interaction of specific forces. Tabulations of typical results of antigen titrations show the effects of variations in bond-strength, steric interaction, relative proportion of reactants, and volume, on the maximal degree of aggregation.

The principal conclusion is that very little aggregation can occur by specific means unless the reactions are irreversible and that, in systems of higher valence, the structural effects of ring closure must be of importance in the application of the "lattice hypothesis".

General inferences in relation to immune precipitates indicate that structural properties are probably more important in determining the properties of the aggregate than is the intrinsic strength of the bond itself: accordingly, immune reactions may show wide variations depending on the physical character of the antigen, differences which are quite independent of the nature of the combining groups.—J. LOCHIEL MCGIRR.

CARLINFANTI, E. (1942). Die Disponibilität der Salmonellenantigene. **[Available reactivity of salmonella antigen].**—*Z. ImmunForsch.* **101.** 339–345. **521**

Vi-antigen heated at 100°C. for a few minutes loses its Vi-agglutinability, but its capacity for combining in the complement-fixation test is then increased. Suspensions containing even a little Vi-antigen appear to possess this property. The phenomenon is discussed in its relation to the lability of the antigenic fractions of salmonella.—D. L. ROBARTS.

YOUNG, E. G., & RICE, F. A. H. (1944). **Leucocytosis as an index of pyrogenicity in fluids for intravenous use.**—*J. Lab. clin. Med.* **29.** 735–741. **522**

A study was made of the criteria which may be used to detect the presence of pyrogenic substances in distilled water or saline solutions intended for intravenous use, and it was shown that by the injection of small quantities of the fluid into dogs it was possible to detect the presence of pyrogenic substances at, or below, the level of concentration which produced symptoms in man. Leucocytosis was the most sensitive of the criteria examined; it was measurable 3–6 hours after the intravenous injection of the fluid to be tested, and it lasted for several hours. Progressively less sensitive criteria were neutrophilia, leucopenia and hyperpyrexia. The level of leucocytosis was approximately proportional to the amount of the pyrogen present in the more dilute preparations and the least amount of solution which produced a positive response contained 0·056 μg. of nitrogen.—T. E. GIBSON.

O'REILLY, M. F. X. (1940). **Leucocytic reaction to bacterial infection in animals.**—*Pap. Mich. Acad. Sci.* **26.** Pt. II. Zoology. pp. 239–250. [Author's conclusions copied *verbatim*]. **523**

1. Large nongranular mononucleated cells of the earthworm engulf infecting organisms and carry them to the posterior end of the body, the last few bacteria-laden segments of which are lost by autotomy.

2. Hyaline thigmocytes of the crayfish phagocytose the infecting organisms and then remove them from the circulating body fluid.

3. Phagocytic leucocytes of perch, goldfish, mud puppy, frog, and snake (monocyte) engulf and digest the injected *S. aureus*, after which changes of the nucleus (pycnosis) and the cytoplasm (vacuolization) are observed. Acid areas resembling Döhle bodies appear in the cytoplasm during the absorption of the digested material.

4. Eosinophils with ellipsoidal or rod-shaped granules engulf the *S. aureus* injected into the snake, turtle, and pigeon. Subsequent changes observed are pycnosis in the nucleus and vacuolization in the cytoplasm. In the snake the eosinophils constitute a second form of phagocyte.

5. Basophilia of the granules in the pseudo-eosinophils of the guinea pig and the rabbit and in the neutrophils of the mouse appear after three days of infection with *S. aureus*.

See also absts. **471** (immunization against bovine brucellosis), **491-494** (against influenza), **667** (against F. & M disease, bovine contagious pleuro-pneumonia, rinderpest), **461** (against fowl coryza), **438** (passive protection against staphylococci), **612** (staphylococcus anatoxin), **441-445** (streptococcus antigens), **470** (ophthalmo-brucellin test for equine brucellosis), **537** (diagnosis of hydatid disease), **534, 538-540, 543** (helminth immunity), **456** (hypersensitivity to *Corynebact. ovis* toxin), **474** (immunology of capsular polysaccharide of *Cl. welchii*).

PARASITES IN RELATION TO DISEASE [GENERAL]

—. (1943). **Report of the Committee on Parasitic Diseases [U.S. Live Stock Sanitary Association].**—*Proc. 46th Meet. U.S. Live Stk sanit. Ass., 1942.* pp. 163–172. **524**

A nation-wide survey was made of the most important parasites of food-producing animals and of the best methods of controlling them.

Bovine trichomoniasis is increasing in incidence and has been reported from all parts of the U.S.A. No satisfactory treatment has been developed. Artificial insemination is recommended for valuable herds as a means of reducing infection. In poultry, trichomoniasis of the upper digestive tract causes considerable mortality especially in turkeys and pigeons. Here also, no satisfactory treatment is known. Some laboratories, however, advocate the use of 1 : 2,000 copper sulphate solution as a substitute for the drinking water.

Hexamitiasis is now widespread in the turkey-rearing areas. It is characterized by catarrhal enteritis which causes severe mortality in young poults. Strict hygiene is the chief method of control.

Coccidiosis of cattle is widespread and causes considerable losses in west coast areas. Some losses are also reported in lambs and locally may be very severe. No reliable curative treatment is known, but sulphur or copper sulphate have been used in some cases. Coccidiosis of chickens is the most important parasitic disease of birds in the U.S.A. In some parts, at least 50% of flocks are infected and losses are heavy. A curative drug has not yet been discovered, but some control is claimed to be obtained by sulphur, vitamin K or sulphaguanidine.

In some southern areas, large numbers of turkeys succumb each year to *Leucocytozoon smithi* infection. The disease is transmitted by simuliid flies and affects young poults. Screening of houses is advocated as a preventive.

Anaplasmosis is known to exist in 23 states and in all parts of the country except the extreme northern and eastern sections. Dipping to control ticks is the chief control measure. In treatment, sodium cacodylate, mercurochrome, or whole citrated bovine blood have been recommended.

Fascioliasis occurs mostly along the west coast. It causes severe economic loss from the condemnation of livers of cattle and sheep. The gulf coast of Texas and parts of Idaho are also areas of severe infestation where up to 50% of livers are condemned. In addition to snail eradication, host treatment with hexachlorethane and kamala extract for bovines and carbon tetrachloride for sheep is recommended.

Taeniasis is important only in sheep and poultry. *Moniezia expansa* in sheep causes considerable losses in a few areas. Control is by avoiding short grass pasture, to preclude the swallowing of the grass mites which are the intermediate hosts. Fowl cestodes are controlled by the removal of debris under which live the ground beetle intermediate hosts. No drug treatment is satisfactory.

Strongylosis is regarded as the greatest hindrance

to an ample meat supply. Almost equally harmful are the lungworm diseases of cattle and sheep. Both conditions are widespread throughout the U.S.A. Oesophagostomes [nodular worms] cause serious damage to sheep intestines, with great commercial loss in casings and material for the preparation of surgical sutures. Lungworms in pigs are very common all over the U.S.A. except on the west coast. They are generally less pathogenic than the corresponding infection in cattle. *Ascaris* infestation of pigs is also very widespread and causes severe losses in young pigs. Trichinosis is fairly common. Reports on nematodes of poultry are confined to *Ascaridia* and caecal worms [*Heterakis*] of chickens which are generally widespread throughout the country. The frequent transmission of blackhead in turkeys by the caecal worm is reported. Recommendations from veterinarians in all parts of the U.S.A. for the control of *Ascaridia* include the use of tobacco dust in the mash, alternated with copper sulphate in the drinking water, treatment with "black leaf 40", and administration of iodine. For *Heterakis*, phenothiazine is recommended, and for *Capillaria*, carbon tetrachloride or tetrachlorethylene. For the removal of strongyles of cattle and sheep, there are 26 recommendations for phenothiazine, 11 for copper sulphate, 3 for tetrachlorethylene, 3 for cunic mixture [copper sulphate + nicotine sulphate] and one for oil of chenopodium. For intestinal worms of pigs, there are 6 recommendations for oil of chenopodium and 4 for phenothiazine.

External parasites which occur widely in the U.S.A. include ticks, mange mites, lice, warbles, sheep bots, screwworm [*Cochliomyia americana*] larvae, and various biting flies.—D. D. Ogilvie.

Fiasson, R. (1943). Notes sur les parasites animaux du Haut-Apure (Venezuela). **[Animal parasites found in Upper Apure, Venezuela].**—*Rev. Sci. méd. pharm. vét., Brazzaville.* **2.** 125–151. **525**

Upper Apure, with a tropical climate, lies between the Apure and Méta tributaries of the Orinoco River. The temperature averages 28°–30°C. and in warm seasons attains a maximum of 40°C. The rainy season starts in May or June and lasts six months. There are certain parasites which are of considerable veterinary importance. *Trypanosoma venezuelense* [= *T. evansi*] parasitizes equine animals and causes a disease known locally as "derrengadera", which has been prevalent in Upper Apure for some years. *Tabanus ferrifer* plays an important role in the transmission of the parasite, and *Chrysops willistoni* is important as vector and possibly as intermediate host. A species which may be *T. vivax* is also considered. Among the helminths, *Ascaris megalocephala* [= *Parascaris equorum*] is usually found at P.M. examination of horses. *Oxyuris equi* occurs in great numbers. *Haemonchus contortus* and *Microfilaria* sp. have also been seen. *Amblyomma cayennense* is probably the most widely distributed tick in S. America and attaches to all animals. 75% of horses are reported to be infested by *Psoroptes equi*. The sucking louse, *Haematopinus asini*, is very common on horses. *Tabanus ferrifer* attacks the abdomen of horses. The hornfly, *Lyperosia irritans*, has been introduced from Colombia and is very troublesome; in Upper Apure, 90% of the cattle carry enormous wounds as a result of attacks by this species.—C. H. S.

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

Rindfleich-Seyfarth, M. (1943). Durch Mallophagen (Federlinge) hervorgerufenes Ekzem der gesamten Rumpfoberfläche bei einer Hausgans. **[Generalized eczema on a goose due to feather lice].**—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* **51 49.** 52. **526**

A case is recorded of a two-year-old gander, kept under unhygienic conditions, which died as a result of infestation with *Hymenolepis* spp. and *Amidostomum anseris*, together with a heavy infestation of the feather lice *Trinotum continuum* and *Lipeurus jejeunus*.—J. B. C.

Boero, J. J. (1943). Breve nota sobre Ornithocoris toledoi. Pinto 1927. Chinche de las gallinas. (Hemiptera-Cimicidae). **[Brief note on the chicken bed bug,** *O. toledoi***].**—*Bol. tec. Direcc. gen. Agric. Ganad., B. Aires.* Secc. Ganad. No. 9. pp. 608–609. **527**

B. gives a brief description of *O. toledoi*, a parasite on fowls in the Argentine as well as in Brazil. The paper is illustrated.—Miller Watson.

Laake, E. W. (1944). **Screwworm survey in the western area of the United States in 1943.**—*J. econ. Ent.* **37.** 319. **528**

In 1943, as a result of drought, several hundred thousand animals were moved from screwworm-infested areas to uninfested areas of the U.S.A., 4–6 weeks earlier than usual. A survey was made of the areas concerned, in order to assess the spread of the pest and to estimate the quantities of insecticide required for its control. The area and intensity of infestation proved to be among the worst on record, some 18 states showing varying degrees of infestation. The survey was successful in introducing control measures to livestock owners not used to dealing with the pest, and led to the establishment of new manufacturing centres for "smear 62", the recommended dressing.—J. B. Cragg.

Schwartz, B. (1943). **Cattle grubs and how to control them.**—*Proc. 46th Meet. U.S. Live Stk sanit. Ass., 1942.* pp. 173–178. **529**

The minimum annual loss in the U.S.A. from warbles in cattle has been estimated at 50 million dollars. Efforts to control or eradicate ox warble-flies have never been made on a significant scale. The common species in the U.S.A. is *Hypoderma lineatum*, which occurs widely. *H. bovis* occurs only in the northern states. About 35% of all hides contain five or more warble perforations. As an alternative to treatment with rotenone preparations which are in short supply, the injection of benzol into each perforation by means of a small oil can is recommended by the Federal Bureau of Entomology and Plant Quarantine.—D. D. Ogilvie.

*Tilemann, F. (1940). Hautreaktionen mit Gastrophilusantigen bei Pferden. **[Skin reactions to** *Gastrophilus* **antigen in horses].**—*Inaug. Diss., Hanover.* [Abst. from abst. in *Zbl. Bakt. I. (Ref.).* **141.** 512.] **530**

The trials were carried out on aged army horses and also on eight *Gastrophilus*-free foals, 11–64 days old, and on a young calf. The intradermal and ophthalmic tests, extracts of *Gastrophilus* larvae being used as antigen, were shown to be unsuccessful in the diagnosis of existent infections and to give positive results in some cases when the larvae had left the body. No reaction was seen in the foals, showing that antibody is not passed from the mare to the foal.—T. E. Gibson.

Sapre, S. N. (1944). **Observations on the biology of** *Ornithodorus papillipes* **Birula.**—*Indian J. vet. Sci.* **13.** 162–165. **531**

The feeding habits and duration of various stages

in the life-cycle of *O. papillipes* were observed. The period of oviposition lasts 4–5 months. The phenomenon of ecdysis was observed.—B. N. Soni (India).

*Zumpt, F. (1943). Rhipicephalus simus Koch und verwandte Arten. [*R. simus* **and related species**].—*Z. Parasitenk.* **13.** 1–24. [Abst. from abst. in *Zbl. Bakt. I. (Ref.).* **144.** 429]. 532

The males of *R. simus* are distinguished by characteristic punctations on the scutum. Between the more or less longitudinal rows of punctations is a series of fine punctures. The adanal shields are the chief characteristic for the distinction of the species and subspecies. In the female there is great morphological variation, and they can often only be named when captured along with the male. The distinctive development of the adanal shields in the forms found in the western and eastern regions of Africa enables two subspecies to be set up, the type form being found in South and East Africa, and a form similar to *R. capensis longus*, named *R. simus longoidus* by Z., being found in West and Central Africa. The following related species were described in greater detail :– *R. distinctus* Bedfort, *R. lunatus*, *R. simus* var. *plana*, *R. reichenowi*, *R. haemophysaloides*, *R. tricuspis*, *R. longicoxatus* Neumann, *R. simpsoni* Nuttall, and *R. deltoidens* Neumann.
—T. E. Gibson.

*van Vonno, N. C. (1943). Huidreacties bij den mensch door den omgang met schurftige runderen. [**Infection of human beings with sarcoptic mange from cattle**].—*Ned. Tijdschr. Geneesk.* **87.** 1082–1083. [Abst. from abst. in *Zbl. Bakt. I. (Ref.).* **144.** 430]. 533

A description is given of a case of human scabies which was caused by *Sarcoptes scabei* var. *bovis*.
—T. E. Gibson.

See also absts. **524** (arthropods in the U.S.A.), **525** (in Venezuela), **666** (*Lyperosia exigua*), **676** (warble control in Cyprus), **668** (vectors of trypanosomiasis in Nigeria), **508** (vectors of "Q" fever), **621–624**, **648** (insecticides).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

Taylor, E. L. (1944). **Helminthological immunity and the control of helminthiasis among grazing animals.**—*Vet. Rec.* **56.** 91–93. Discussion p. 93. 534

T. discusses mainly the immunity displayed by animals grazing on enclosed pastures, which serve as a medium for the transference of helminth infestations. The worm population of grazing animals varies with any change in their general level of immunity. The introduction of immune animals into heavily infested pastures is followed by a reduction in the number of larvae per lb. of herbage, whilst the presence of young, susceptible animals leads to a rise in the number of larvae. To avoid disease in young stock it is necessary to protect their developing immunity by anthelmintic treatment, and by providing food supplements and clean pastures [see also *V. B.* **13.** 363]. T. suggests that, in view of the resistance encountered in adult stock, grazing adults with young animals on heavily infested pastures should benefit the young stock, because the adults would remove ten times as many larvae as they would add to the pasture. [See also *V. B.* **10.** 264.]
—M. L. Bingham.

Maqsood, M. (1944). **Acute amphistomiasis in a cow in northern India.**—*Indian vet. J.* **20.** No. 5. 266–269. 535

A report on a case of acute disease in a cow at Lahore, caused by *Paramphistomum cervi*.
—H. D. Srivastava (India).

Wolfe, H. R. I. (1943). **Hydatid disease in Wales.**—*Lancet.* **244.** 795–799. 536

W. points out that hydatid disease in man is more common in Wales than elsewhere in Great Britain, and considers that this is due partly to ineffective supervision of abattoirs in some areas and partly to lack of knowledge by the public of the necessary preventive measures. The 34 cases of the disease treated during 1926–38 at the Royal Infirmary, Cardiff, are reviewed and the symptoms, diagnosis, pathology, and treatment discussed. Of the 34 cases, 16 were fatal. W. considers it important for the condition to be borne in mind, at least in Wales, and for full use to be made of the laboratory.—J. N. Oldham.

*Fisahn, H. (1942). Die Diagnose des Echinococcus und das mega- und mikroskopische Bild der intracutanen Echinantigenreaktion. [**The intradermal test for hydatid disease: macroscopic and microscopic picture of the skin reaction**].—*Virchows Arch.* **309.** 471–501. [Abst. from abst. in *Jber. Vet.-Med.* **71.** 133.] 537

Following *Echinococcus* infection, a specific allergic reaction develops which is manifested by eosinophilia and the production of specific antibodies to an antigen prepared from the hydatid contents. The antibody index can be determined by the complement-fixation test or by the intradermal test using *Echinococcus* antigen. F. describes the method of performing this test together with the macroscopic and microscopic appearance of the positive reaction. In all reactions, inflammation was seen, with a heavy infiltration of eosinophiles and lymphocytes. Early and delayed reactions are described, both showing a similar histological picture. Several reactions and phenomena described by other authors are shown, by a study of the histological picture, to be essentially allergic in character.
—T. E. Gibson.

Larsh, J. E., Jr. (1943). **Serological studies on the mouse strain of the dwarf tapeworm,** *Hymenolepis nana* **var.** *fraterna.*—*Amer. J. Hyg.* **37.** 289–293. 538

L. showed that specific agglutinating, precipitating, and complement-fixing antibodies were elaborated in white mice infected with *H. nana* var. *fraterna*. Two rabbits, repeatedly injected with the cestode antigen, also showed complement-fixing antibodies. A report is given of tests which indicate that Forssman's heterogenetic antigen is absent from this tapeworm.—J. N. O.

Larsh, J. E., Jr. (1944). **Studies on the artificial immunization of mice against infection with the dwarf tapeworm,** *Hymenolepis nana* **var.** *fraterna.*—*Amer. J. Hyg.* **39.** 129–132. 539

By repeated intraperitoneal injections of suspensions of fresh adult *H. nana* var. *fraterna* antigen, L. was able to produce in mice an immunity to infection with this tapeworm. In the immunized mice, only a quarter as many cysticercoids developed as in unimmunized mice which had been fed corresponding numbers of eggs. Injections of the antigen into pregnant female mice induced a certain degree of resistance in the offspring, although it was not as high as that of offspring born of and nursed by infected mothers.—J. N. O.

Larsh, J. E., Jr. (1944). **The relation between splenectomy and the resistance of old mice to infection with** *Hymenolepis nana* **var.** *fraterna.*—*Amer. J. Hyg.* **39.** 133–137. 540

L. has shown that white mice, five months of age

or older, which have been splenectomized when quite young, are more susceptible to an initial infection with *Hymenolepis nana* var. *fraterna* than are intact mice. Associated with this increased susceptibility, he found a pronounced decrease in the haemoglobin level and a well marked anaemia and these he considers to be probably an important factor in reducing resistance. It is not understood why the anaemia produced by splenectomy was progressive, but blood smears showed that the condition was not due to bartonella infection.

—J. N. OLDHAM.

TAYLOR, E. L. (1944). **A search for endemic areas of trichinosis in Great Britain. [Correspondence].**—*Nature, Lond.* **153.** 745–746. **541**

The outbreaks of clinical trichinosis at Wolverhampton, Penrith, and Harpenden during the winter of 1940–41 emphasized the necessity of discovering the origin of infection in Great Britain. T. considers that the explanation made in the past, of outbreaks being due to imported trichinosed pork which had occasionally eluded the meat inspection barrier, now appears to be inadequate. In the belief that reservoirs of infection exist amongst animals in this country, particularly amongst rat-eating animals in districts where trichinosis is prevalent in rats, T. examined microscopically by means of crush preparations and after peptic digestion the muscles of 636 stoats, 78 weasels, and 2 polecats. Unfortunately none of the animals was secured from any of the areas in which trichinosis had recently appeared in man. As no *Trichinella* larvae were found in any of the 716 carcasses, T. concludes that the parasite has a sparse distribution throughout England and that reservoirs of infection are confined to a few relatively small areas.—J. N. OLDHAM.

*STAUDACHER, W. (1943). Zur Klinik der Trichinose. **[Human trichinosis].**—*Dtsch. Arch. klin. Med.* **191.** 128. [Abst. from abst. in *Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* **52/50.** 17–18]. **542**

A report is given of an outbreak of human trichinosis involving 668 persons, which occurred in Halden in southern Norway in September 1940. A home-slaughtered pig, passed without an examination for trichinosis by the meat inspector, was almost entirely made up into Bologna sausage and consumed uncooked by personnel of a battalion of troops stationed in the vicinity. With a few exceptions, those who had eaten the sausages contracted more or less severe trichinosis, one case being fatal. In investigations following this outbreak, it was shown that infection of Norwegian pigs with trichinosis is very widespread. The uncontrolled importation of American pork and fur-bearing animals and the expansion of fur-breeding in Norway, are held responsible. The low incidence of trichinosis in human beings in Norway is ascribed to the fact that pork is only consumed in a cooked or heavily smoked condition. A trichinous papillary myocarditis caused by migrating *Trichinella* larvae was described, upon which, it is stated, depends the course and severity of the disease. In treatment, early administration of circulatory stimulants and fuadin was useful.

—T. E. GIBSON.

ROTH, H. (1943). **The role of the intestinal phase of trichina infection in the establishment of immunity to reinfection.**—*Amer. J. Hyg.* **38.** 99–111. **543**

R. produces evidence that a persistent and more or less pronounced immunity to muscular trichinosis develops 6–17 weeks after a purely intestinal infestation produced by dosing with larvae all of one sex. Sublethal doses of 500–600 larvae of both sexes given to ten g. pigs after purely intestinal infestations with 100–300 wholly male or female larvae resulted in 0·1–86·0% of the average infestation of the previously uninfected controls. When lethal doses of 1,000 or 2,000 larvae of both sexes were given after an initial infestation with 160–400 wholly male or female larvae, all the controls given a similar dose died within eight weeks, whereas 44% of the immunized g. pigs survived this period and their degree of muscular infestation was comparatively small. Each of four g. pigs previously infected with four male and eight female larvae and reinfected with 1,000 larvae, not only tolerated this lethal dose but showed less muscular infestation than was to be expected. Immunity to reinfection thus appears to be a true, acquired immunity which is initiated in the intestinal phase, but which may be greatly increased by the dissemination of larvae throughout the tissues.

—J. N. OLDHAM.

GALOFRÉ, E. J., & ROSA, W. A. (1942). Ensayos sobre resistencia de larvas de estrongilidios del caballo. **[Viability of horse strongyle larvae].**—*Inst. Parasit., Fac. Agron. Vet., Univ. B. Aires.* **2.** No. 4. pp. 51. [English summary]. **544**

The viability of the larvae of horse strongyles under varying circumstances was investigated. It was found that the eggs do not develop at temperatures below 6°C. and that hatching of the larvae takes place at temperatures up to 45°C. Infective larvae survived a temperature of 0°C. for as long as 680 days, and were still viable after 540 days at 35°C. dry heat. At 45°C., however, they only survived for 96 days. Increases in temperature and humidity shortened the life of the larvae.

When submerged in water at 0°C., infective larvae survived for 684 days, but when submerged at 9°–30°C., they did not survive longer than 128 days. Immature larvae were also resistant to dry heat, surviving for 252 days at 30°C. and for 95 days at 35°C.—M. WATSON.

DOLL, E. R., & HULL, F. E. (1944). **Nematode parasitism of sheep.**—*J. Amer. vet. med. Ass.* **105.** 13–21. **545**

In this comprehensive article, evidence is quoted to show that nematode parasitism causes heavy losses to American sheep farmers. Macroscopic and microscopic P.M. lesions in heavily parasitized sheep are described. Anthelmintic medication appears to be of great value as an adjunct to adequate feeding and pasture management in an effort to limit infestation, but the authors consider that treatment for clinical cases has been overrated in the past.—G. B. S. HEATH.

SHORB, D. A. (1944). **Survival on grass plots of eggs and larvae of the stomach worm,** *Haemonchus contortus.*—*J. agric. Res.* **68.** 317–324. **546**

Faeces of sheep infested with *H. contortus*, and in some cases with a few *Strongyloides papillosus*, were placed in the centre of grass plots, and at varying intervals of not less than a week the grass, surface soil, and soil to a depth of 1 in. were examined for the presence of infective larvae. The number of larvae in a control sample of faeces, cultured in the laboratory, was also estimated for comparison. A detailed summary of the weather conditions prevailing at the time in the area (Beltsville, Md.) is given in tabular form.

In August 1936, 100 g. of crushed, fresh sheep faeces were placed in the centre of each of 16 plots. During the first two months grass only, and later both grass and soil were examined. There was a gradual fall in the number of larvae recovered, from 1,500 on August 19th to 14 on May 4th of the following year, with a slight rise in March. The larvae recovered in April and May were vacuolated and probably not infective. The control culture yielded 50,000 larvae. A second experiment was also begun in August 1936,

but two months passed before weekly examination of the plots was begun. The number of larvae recovered decreased from 118 in December to none in May, with a slight rise in March as before. All the larvae were dead after seven months and it is probable that the feeble and vacuolated larvae which were recovered in April were not infective. Culture of the faeces used yielded an average of 100,000 larvae.

A third experiment was begun on August 5th, 1937, 50 g. of faeces (control cultures of which yielded 10,640 larvae) being placed on the centre of each of 12 plots. Owing to an apparent rapid loss of larvae or eggs the plots were reinfected on August 20th, 70 g. of faeces being used which had been cultured for four days, and control samples of which yielded 27,265 larvae. Larvae were found at all times from August 28th to November 18th on the grass, in the surface soil, and under the surface. The loss of larvae was constant and rapid, recoveries decreasing from 6,000 on August 28th to 49 on November 18th.

In a fourth experiment the possibility of survival of pre-infective stages was eliminated by infecting 16 plots with faeces containing infective larvae only. The control sample contained 38,500 larvae. Collections were made approximately weekly from October 18th to March 24th, except that no soil samples were taken during December to March whilst the soil was frozen. The decrease in the number of larvae was constant and rapid, although a rise took place in March and also an unexplained rise during late November and early December. In this experiment 52·5% of the larvae were recovered seven days after the beginning of the experiment, whilst in the first experiment, in which eggs were used, only 3% of the larvae were recovered eight days after the beginning of the experiment. This is taken to indicate a high death rate among eggs and pre-infective larvae, and a much lower one for infective larvae.

In view of these findings, S. states that under similar climatic conditions, pastures kept free from sheep from October to mid-April will contain only a few larvae of *H. contortus* still capable of infecting sheep.
—T. E. Gibson.

*Joyeux, C., & Gaud, J. (1943). La pneumonie vermineuse des ovins au Maroc. **[Verminous pneumonia in sheep in Morocco].**—*Bull. Soc. Path. exot.* **36.** 232–235. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **144.** 426]. **547**

In Morocco the nematodes present in sheep with lungworm disease were *Dictyocaulus filaria, Protostrongylus rufescens, Cystocaulus ocreatus,* and *Muellerius capillaris.* The lesions of lungworm disease consisted principally of tumour-like nodules, the spread of the disease taking place along the air passages. The reaction to the presence of the worms took place slowly.

[Although lungworms were present in the sheep examined by these authors, the slow development of the condition and the spread of lesions along the air passages suggest that the disease described may have been jaagziekte, but sufficient detail is not available in the abstract for a final decision on this point.]
—T. E. Gibson.

Dhayagude, R. G. (1944). *Diro-filaria repens* **infestation of dogs.**—*Indian J. vet. Sci.* **13.** 171–173. **548**

D. repens was found to be the common filarial worm in 201 dogs in Bombay, infesting about 5% of the animals, but causing no apparent inconvenience. The microfilariae showed periodicity.
—H. D. Srivastava (India).

See also absts. **524** (helminths in the U.S.A.), **525** (in Venezuela), **625–632** (anthelmintics), **649** (enterotomes).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

Priouzeau, M. (1943). Tumeurs chez le poulain. **[Tumours in foals].**—*Rec. Méd. vét.* **119.** 113–116. **549**

Two cases of tumour in foals are reported. In one case, in a foal aged four months, there was a large growth arising from the right maxilla. In its final stage it was larger than a man's head and protruded from the mouth. Biopsy showed it to be a myxosarcoma showing a tendency to develop into osteochondro-sarcoma. It was removed surgically but recurred rapidly, and the foal was destroyed.

A [? cheloid] growth in a foal aged 15 months had formed on the site of a scar resulting from a large wound involving all tissues down to the periosteum in the right metatarsal region. Despite treatment, it increased to a huge size and was finally removed surgically. At this stage, a similarity to the gross structure of the tumour described in the first case was noted, *i.e.*, a superficial layer of vascular fibrous-fatty tissue, and then a hard, gritty, spicular, and cartilaginous zone. P. reports that the growth has not reappeared over a period of nine years, although the metatarsal bone is thickened, hard, and insensitive. He assumes identity with the first tumour described on gross appearance only, no histological examination having been made. P. considers that the successful treatment of this second case was due to total extirpation of diseased tissue, then cauterization, followed by compresses soaked alternately in boracic acid and potassium permanganate and removed every three days until healing was well advanced.—John G. Campbell.

Juhn, M. (1944). **Feather germ reaction to urine from patients with cancer and other conditions. A preliminary study.**—*Arch. Path.* **37.** 383–386. [Author's summary copied *verbatim*]. **550**

The pigmentation reaction of the growing feather germ of the Brown Leghorn capon has been used to record the effects of injected urines from cancerous, other pathologic and normal subjects. With the injection of the concentrate equivalent of 20 c.c. of fresh urine on two successive days, the responses obtained from urines of the main classifications, including some obtained on repeated tests, were as follows :

From urines of males : Cancer—15 positive reactions in 24 tests. Cancer suspected—2 positive reactions in 6 tests. After surgical intervention for cancer—7 negative and no positive responses. Other conditions—3 positive reactions in 8 tests. Normal—8 negative and no positive reactions.

From urines of females : Cancer—27 positive responses in 28 tests. Cancer suspected—1 positive reaction in 3 tests. After surgical intervention for cancer—9 negative and 1 positive reaction. Other conditions—3 positive reactions in 3 tests.

Friedewald, W. F., & Rous, P. (1944). **The initiating and promoting elements in tumor production. An analysis of the effects of tar, benzpyrene, and methylcholanthrene on rabbit skin.**—*J. exp. Med.* **80.** 101–126. **551**

The writers show that benzpyrene initiates neoplastic change in rabbit epidermis much sooner than

has been supposed. Visible growths take a long time to appear because of the relatively slight power of this substance to encourage multiplication of the cells which it renders neoplastic. Methylcholanthrene causes neoplastic change in less than 17 days, whereas tar has the same effect in less than ten days, but tumours due to tar appear months before those due to methylcholanthrene. Tar tumours are fleshy, vigorous growths, whilst those due to benzpyrene and methylcholanthrene tend to remain small, dry, and indolent for a long while.

Tar and polycyclic hydrocarbons cause more cells to become neoplastic than to give rise to visible growths. Benzpyrene dissolved in benzene initiates visible tumours months earlier than when dissolved in mineral oil, because when in oil it has little influence on cell proliferation, yet neoplastic change is recognizable histologically at about the same time whatever the solvent. Benzene itself has only a slight influence of this sort. Solvents may not only determine whether carcinogens initiate neoplastic change, but may also condition the influence of these agents to encourage tumour formation.

Rabbit epidermis responds much more readily to carcinogens than that of the mouse, as measured in time taken to elicit benign tumours. Even benzene can bring about these growths from rabbit skin.

Finally, it is pointed out that in assessing the relative responsiveness of various animal species to carcinogens, it is essential to reckon in terms of cells of identical type.—JOHN G. CAMPBELL.

*DOINEL, M. A. J. (1943). Les leucoses et la génétique. [**Leucoses and genetics**].—*Thesis, Alfort.* [Abst. from abst. in *Rec. Méd. vét.* **119.** 109]. **552**

In chapter 1, D. gives a history of leucosis and general information regarding species susceptibility, epidemiology, and exogenous and endogenous factors, particularly those involved in the infectious and neoplastic theories. He states that the causal agent is the result of cellular irritation, that it is ultravisible, transmissible, and can only be reproduced in the presence of living cells.

In the second chapter, the theory is dealt with that the internal factor is hereditary and that predisposition is passed on as a recessive character in the normal body. D. points out the distinct predisposition seen in birds, laboratory animals, and domestic mammals, especially cattle, and discusses the control of leucoses by selecting resistant strains. He suggests that, in cattle, affected males should be castrated and affected females slaughtered. In birds, however, eradication of leucosis by building up resistant strains is possible but difficult, owing to the increasing incidence of the disease.

—ANTHONY BUXTON.

*MATZKE, M. (1943). Empfänglichkeit verschiedener Vogelarten für die Mareksche Geflügellähme. [**Susceptibility of birds to fowl paralysis**].—*Tierärztl. Rdsch.* pp. 37–39. [Abst. from abst. in *Jber. Vet.-Med.* **71.** 148]. **553**

Nerve tissue from affected fowls was not infective to 42 young budgerigars, 29 young pigeons, or four geese.—J. G. CARR.

ROUS, P., & FRIEDEWALD, W. F. (1944). **The effect of chemical carcinogens on virus-induced rabbit papillomas.**—*J. exp. Med.* **79.** 511–538. [Authors' summary copied *verbatim*]. **554**

The application of methylcholanthrene and tar to virus-induced papillomas of the domestic rabbit caused them to become carcinomatous with great rapidity, and the malignant changes were frequently multiple. In bringing on the cancers the chemical agents acted in their specific capacity as carcinogens, not as ordinary stimulants of cell proliferation. The cancers derived from the virus-infected cells and were of the same types as arise from these elements spontaneously after a much longer time.

The evidence would seem to indicate that the chemical carcinogens acted by way of the virus.

See also absts. **680** (avian leucosis complex), **592** (carcinogenic action of oestrogens), **588** (action of benzpyrene on wounds).

DISEASES, GENERAL

—. (1943). **Report of the Committee on Miscellaneous Transmissible Diseases [U.S. Live Stock Sanitary Association].**—*Proc. 46th Meet. U.S. Live Stk sanit. Ass., 1942.* pp. 28–31. **555**

During the year no extensive outbreaks occurred. Equine encephalomyelitis was less prevalent than in any other year since 1936. Up to November 1st, only 3,200 cases had been notified. A limited but sharp outbreak of the disease occurred late in the season in Michigan. Some 74 cases of E.E. were reported in vaccinated animals. A reduction of the disease in man was also noted. An unusual increase in the incidence of bovine mastitis occurred. No treatment is regarded as satisfactory. A specific mastitis in sheep caused by *Pasteurella mastitidis* was responsible for losses in the range states. The disease was so acute that treatment was impracticable. In the western states, vaccines for bacillary haemoglobinuria [*Clostridium haemolyticum* infection] of cattle and black disease (*Cl. novyi* infection) of sheep proved very effective. The potential value of sulphaguanidine in disease control and treatment is stressed. The tolerance of animals for the drug is high. It had been shown under U.S.A. conditions to be particularly valuable in necrotic enteritis of pigs, coccidiosis and bacterial enteritis of lambs, and white scour of calves. Supplies of the drug were plentiful.

—D. D. OGILVIE.

—. (1943). **Report of the Committee on Transmissible Diseases of Poultry [U.S. Live Stock Sanitary Association].**—*Proc. 46th Meet. U.S. Live Stk sanit. Ass., 1942.* pp. 238–242. **556**

Adult poultry mortality has doubled in the U.S.A. during the last 20 years and disease now accounts for the deaths of about 150 million adult birds per year.

In connexion with the pullorum-disease control programme, over 96% of the birds under the National Poultry Improvement Plan were tested during 1941–42. In approximately 70% of official testing the rapid test [whole blood plate test carried out in the field] was used, in 28% the tube test, and in 2% the plate serum method [blood serum test carried out in the laboratory]. In all about 17 million birds were tested, with about 3% reactions. The problem of nonspecific reactors is very troublesome in some localities, especially during the autumn, and requires investigation. Progress in pullorum disease eradication in turkeys is not as successful and in this species the disease is increasing in prevalence.

Virus diseases continue to receive attention. A virus has been isolated from birds affected with "blue comb" or "pullet disease"; a new virus respiratory disease has also been reported, and another virus disease with respiratory and nervous symptoms has been described. Psittacosis virus has been isolated from

pigeons and chickens, and consequently the name of the disease has been changed from psittacosis to ornithosis. Infectious bronchitis has become a serious problem because of its wide distribution. The mortality from it is only about 5%, but the loss in production is very great. Research into this condition is urgently required. The incidence of the avian leucosis complex is rapidly increasing, and here also intensive research is indicated.

Protozoan diseases are of widespread importance. Infectious catarrhal enteritis of turkeys has been shown to be caused by *Hexamita meleagridis* and control measures are now available. Trichomoniasis is a serious problem in turkeys and chickens in some areas. Losses may be very severe, the average mortality in infected flocks being about 50%. It has been shown that feeding steamed bone-meal aggravates the effects of coccidiosis in chickens and it is advocated that this finding should be taken into account in making up wartime poultry diets.—D. D. OGILVIE.

GORDON, I. (1944). **A classification of deaths of medico-legal importance.**—*Brit. med. J.* Sept. 9th 337–338. **557**

Deaths of medico-legal importance are usually classified into three groups—coma, syncope, or asphyxia—and three series of pathological changes have been described as characteristic of these types. This classification is unsatisfactory since "asphyxia" is not a pathological entity and cannot be recognized on the basis of morbid anatomical findings alone. Cessation of vital functions depends on the production of tissue anoxia and this may be brought about in four different ways :—(1) defective oxygenation of blood in the lungs (anoxic anoxia); (2) reduced oxygen-carrying capacity of the blood (anaemic anoxia); (3) depression of oxidative processes in the tissues (histotoxic anoxia), and (4) inefficient circulation of blood through the tissues (stagnant anoxia). All these types of anoxia cause circulatory failure which may result in death and it is convenient to classify deaths of medico-legal importance by the way in which the tissue anoxia is produced. G. gives examples of the way in which each of the four types of anoxia may be brought about and emphasizes that the general pathological changes found at autopsy may be similar in all of them. It is not justifiable to certify that death occurred from asphyxia if the opinion is based merely on the finding of visceral congestion and capillary haemorrhages. The latter changes are not specific and must be distinguished from pathological changes which are dependent on the type of death, such as local injuries to the neck in strangulation or colour of the blood in carbon monoxide poisoning.—E. G. WHITE.

*BEIJERS, J. A. (1942). Enkele ervaringen omtrent de aandoeningen der lucktwegen en longen bij het paard, gedurende het laatste jaar. **[Experiences with respiratory diseases in the horse during 1941].**—*Tijdschr. Diergeneesk.* p. 141. [Abst. from abst. in *Skand. VetTidskr.* **33.** 380 & 381]. **558**

Equine respiratory diseases observed in Holland in 1941 appear to have included strangles, Brussels disease [= infectious bronchitis—see table and footnote, *V. B.* **12.** 580.], and contagious pneumonia. Roaring, paralysis of the bladder, and neuritis caudae equinae occurred as nervous complications. Bilirubinaemia of 20–30 mg. per litre of blood was often seen in cases of contagious pneumonia. Neosalvarsan acts specifically in this disease and is therefore of diagnostic as well as curative value. Infectious bronchitis does not respond to the drug.—J. E.

BURKSER, G. V. (1941). Obzor estestvenno-istoricheskikh usloviĭ razvitiya "suĭlyuka" i osnovnye momenty profilaktiki etovo zabolevaniya. **[Factors influencing the course and prophylaxis of "suĭlyuk" in horses (a broncho-pneumonia)].**—*Trud. XV Plen. vet. Sekt. Akad. sel'khoz. Nauk, Moscow, 1939.* [*Diseases of Horses*]. pp. 103–105. **559**

B. reviews the geographical, climatic, and botanical conditions in regions where "suĭlyuk" occurs [see also ZARUBKINSKIĬ—*V. B.* **13.** 528]. Injury due to feeding on mouldy fodder preserved in "samans" (crude trench silos) is probably an important predisposing factor. Heavy gastric helminth infestation may be a secondary causative factor. Various hygienic measures of a general character are recommended for control. Meat from animals affected with this condition and slaughtered as a measure of food conservation is regarded as safe for human consumption after boiling or salting.—A. M.

SUBOTNIK, A. S. (1941). Eksperimental'naya periodicheskaya oftal'miya loshadeĭ. **[Experimental periodic ophthalmia in horses].**—*Trud. XV Plen. vet. Sekt. Akad. sel'khoz. Nauk, Moscow, 1939.* [*Diseases of Horses*]. pp. 132–134. **560**

S. claims to have succeeded in transmitting periodic ophthalmia from an acutely affected horse to six normal horses by injection into the eye of vitreous humour from an affected eye. Recurrence of the ophthalmia did not, however, occur in the inoculated horses, and the condition did not spread from the injected eye to the other one. It was not possible to transmit the disease from the experimentally produced cases to other horses. Attempts to effect transmission by other routes in horses and by injection into the eyeball in g. pigs and rabbits also failed.

It is considered that the infective factor is a filtrable virus, but no evidence is presented.—A. MOLDAWSKY.

WEISCHER, F., & HOLLE, A. H. (1943). Wesen und Behandlung der "Steingeschwulst" des Rindes (Pathologische Form des puerperalen Euterödems). **[Nature and treatment of pathological udder oedema in cows at the puerperium].**—*Dtsch. tierarztl. Wschr./Tierärztl. Rdsch.* **51/49.** 14. **561**

A description is given of a marked oedema of the udder prior and subsequent to parturition. The condition does not respond to treatment and returns at each calving. The author recommends that affected cows should be slaughtered or kept only for beef purposes. —D. L. ROBARTS.

EMMERSON, M. A. (1944). **Rupture of the prepubian and subpubian tendons in the cow.**—*Vet. Ext. Quart. Univ. Pa.* No. 94. pp. 3–15. **562**

An account of the conditions in which rupture of the prepubic and subpubic tendons in the cow occurs, of the anatomical structures involved, and of the surgical treatment.

*MAAS, A., & KÖBE, K. (1943). Beobachtungen über das Auftreten des sogenannten Herztodes beim Schwein. **[Fatal syncope in swine].**—*Berl. Münch. tierärztl. Wschr.* pp. 1–6. [Abst. from abst. in *Jber. Vet.-Med.* **71.** 106]. **563**

Death from syncope occurs at random and at all ages, either without previous symptoms or after illness lasting only a few hours. The symptoms include inappetence, trembling, gasping, paralysis of the hind limbs, bluish coloration and slight swelling of the ears, and reddening or pallor of the skin. Greyish spots are found P.M. in the heart, especially the left ventricle, and rarely, the heart is completely greyish-white. The mucous membranes are reddened, with some blood spots, as is the bladder. The liver and spleen are slightly swollen. Skeletal muscles are pale in colour. Similar appearances are occasionally encountered in pigs apparently normal when slaughtered. Most cases

are encountered between May and August, and January and February. The degree of incidence varies with the incidence of swine fever. It is considered that the disease may be related to the action of a virus.

—J. G. CARR.

—. (1944). **Marie's disease in dogs.**—*J. Amer. vet. med. Ass.* **105.** 35–36. **564**

A brief comment on Marie's disease (hypertrophic pulmonary osteo-arthropathy, acropachia) in the dog. No new facts are included.—E. COTCHIN.

DAVIS, L. J. (1943). **Haemolytic anaemias.**—*Edinb. med. J.* **50.** 589–616. **565**

The more important advances in the study of haemolytic anaemias are discussed. Haemolytic anaemias are defined and the normal mechanism of red cell destruction is outlined. Increased excretion of faecal urobilinogen, and the presence of albuminuria and a haemoglobinuria are of value for the unequivocal diagnosis of excessive or abnormal blood destruction.

Haemolytic disorders of man are classified according to their known or supposed aetiology. These include those due to abnormalities of the red cells, those due to circulating haemolysins, the anaemias which occur in certain types of poisoning, parasitic infections, and in cases of sensitivity to drugs, as well as those of which the cause is unknown. Each group is discussed in detail and over 100 references to the literature are given.

—K. L. BLAXTER.

DOMRACHEV, G. V. (1941). K klassifikatsii miokarditov. **[Classification of forms of myocarditis].**—*Trud. XV Plen. vet. Sekt. Akad. sel'khoz. Nauk, Moscow; 1939.* [*Diseases of Horses*]. pp. 262–264. **566**

On the basis of determination of arterial and venous blood pressure, electrocardiograms, pulse rate, etc., D. recommends the classification of clinical myocardiac affections into (1) acute, chronic, diffuse, and focal myocarditis ; (2) acute and chronic myocardial degeneration (dystrophy), and (3) cardio-sclerosis (cardiofibrosis). He gives a short clinical picture and discusses treatment of each form of the disease.—A. MOLDAWSKY.

DAUBER, D. V. (1944). **Spontaneous arteriosclerosis in chickens.**—*Arch. Path.* **38.** 46–51. [Author's summary copied *verbatim*]. **567**

Spontaneous arteriosclerosis of the aorta develops in 45 per cent of commercial roosters and hens over 1 year of age. The incidence of macroscopic lesions is the same in both sexes. Hens alone show fatty lesions of the intima of the ascending aorta and arch, while both roosters and hens commonly have intimal lesions of the abdominal aorta.

Arteriosclerosis in the chicken resembles human arteriosclerosis. Arteriosclerosis occurring spontaneously resembles that produced by cholesterol feeding.

The chicken is a suitable animal for the experimental production of arteriosclerosis if used before the age of 6 months, when spontaneous arteriosclerosis begins to occur. It is furthermore a suitable animal for studies on the prevention of arteriosclerosis because of the high incidence of the spontaneous disease and the early age at which it begins.

DUBLIN, W. B., & SCHLOTTHAUER, C. F. (1944). **Chronic focal encephalitis in a dog resulting in cerebral necrosis. Report of a case.**—*N. Amer. Vet.* **25.** 356–358. **568**

A Boston terrier showed symptoms over a period of six weeks of gradual and progressive paresis affecting the left side of the body. The animal was blind in the left eye. At autopsy the only significant lesion was an area of necrosis and softening in the left cerebral hemisphere which had destroyed varying proportions of the basal nuclei, particularly the thalamus and th posterior part of the caudate nucleus. The visu radiation appeared to have been interrupted. Histo logical sections revealed a subacute or chronic foc encephalitis with central necrosis. There was n evidence of bacteria or fungi and the histological feature were not indicative of any specific infection.—E. G. W

ESSEX, H. E., SCHLOTTHAUER, C. F., & KEITH, H. M (1944). **Symptoms caused by experimentally pro duced lesions in the cerebrum of dogs.**—*Amer. J. ve Res.* **5.** 274–278. **56**

Cerebral injury was produced in dogs by applyin carbon dioxide snow to the brain for a period of 2 mi The animals were operated on under ether anaesthes and the trephined portion of bone was replaced and th wound closed, the whole operation being carried ou with careful attention to asepsis. The lesions wer about 2 cm. in diameter and were mostly 2 cm. posteric to the crucial fissure. Lesions were first produced o the right side and animals which recovered were operate on again 21–80 days later on the left side.

Of 20 dogs used, 18 survived the first operation eight of them showed nervous symptoms, mainl epileptiform fits and convulsions. The fits began a localized convulsions which rapidly spread and becam generalized. There was twitching of the face muscles clonic jerking of the legs, and champing of the jaws During the recovery period there were often runnin movements. Disturbances of intelligence or vision wer not observed. The two animals which died developec subdural haematomas. The nervous symptoms occurre at periods varying from 40 minutes to 7½ hours afte the operation.

Of the 18 dogs operated on for a second time, fiv died with severe cerebral haemorrhage and these five together with ten of the 13 animals which recovered showed epileptiform fits and convulsions at period varying from one hour to 11½ hours after the operation

The operation wound healed within three week and after six weeks the brain lesions appeared as shallow depression marked by some scar tissue. Healin lesions showed haemorrhage and leucocyte infiltration the latter consisting of clumps of segmented leucocyte which were not aggregated in the perivascular space as is the case in lesions due to infectious agents.

—E. G. WHITE

LYNN, J. G., & PUTNAM, T. J. (1944). **Histology o cerebral lesions produced by focused ultrasound.**— *Amer. J. Path.* **20.** 637–649. **57(**

In cats, dogs and monkeys, lesions of the brai and spinal cord were produced by the use of a focuse beam of ultrasonic (supersonic) waves, with a frequency of 835 kilocycles per sec., applied for periods varyin from 5–15 min. The waves were produced by move ments of a quartz plate under the influence of alternatin current. The most striking effects were :– blindnes after transcranial irradiation of the striatal region of th occipital cortex, ipsilateral incoordination and ataxi from application to one lobe of the cerebellum, bilatera paralysis and anaesthesia of the hind extremities afte treatment of the lumbar cord, and paresis of the righ forelimb after irradiation of the corresponding moto area in the left cerebral cortex. The lesion produce consisted of a cone-shaped area of necrosis 1–2 cm across at the base and extending about the same distanc below the surface of the brain or cord. Ganglion cell were the most vulnerable to supersonic waves, glia cells were either destroyed or induced to proliferate and blood vessels were more resistant. At the site o irradiation the skin and soft tissues showed swellin and oedema, followed after 8–9 days by dry gangrene.

The monkey was the most suitable animal for this

work because of the almost complete lack of radiation-absorbing muscle tissue over the skull covering the motor and occipital regions of the cerebral cortex and also because of the more clear-cut and more persistent disabilities following irradiation.—E. G. WHITE.

DEVOLT, H. M. (1944). **Lamellar cataract in chickens.**—*Poult. Sci.* **23.** 346–348. **571**

Cataract originating from an unknown cause was observed in a flock of 50 Barred Plymouth Rocks. These birds were kept as a backyard flock, having been purchased as day-old chicks and brooded in the cellar of a dwelling house, electric light bulbs providing the necessary heat. At about three months of age, the birds were moved from the cellar and placed in a coop in the yard. Disease was first observed when the birds were 3½ months old, individual birds being noticed to carry their heads in a peculiar slanting position. After a careful examination, nine chickens were found to be affected with cataracts, in most cases the opacity being bilateral and varying from a slight clouding to a distinct greyish-white patch near the centre of the pupil. The cataracts were found to be situated in the region between the capsule and the nucleus and to consist of coalescing flakes and discs both anterior and posterior to the nucleus. In lenses removed at autopsy there was a tendency to liquefaction in the cataract zone. Floating or settling of the opacities in the living eyes was not observed, and there was little or no change noted in the cataracts over an observation period of eight months.

A subsequent brood of 50 chicks of a different breed was raised with the same feed and equipment without developing cataracts, but in this case the birds were kept in the cellars for a much shorter period.

The presence of a strong light, together with a war-time ration, were considered as possible environmental factors in the causation of the cataracts.

—J. D. BLAXLAND.

*LESSING. (1943). Ekzem mit Haarausfall. [**Eczema with loss of hair in horses**].—*Z. Veterinärk.* **55.** 78–79. [Abst. from abst. in *Jber. Vet.-Med.* **71.** 116]. **572**

A number of horses kept under a temporary shelter of pine branches at the south-west of Lake Ilmen showed a sudden loss of hair, starting at the croup and resulting in almost complete loss of hair. Parasites were not implicated, and recovery was complete. It is suggested that the cause may have been tannic acid extracted from the tree branches by copious rain occurring at the time.—J. G. CARR.

MADSEN, L. L., EARLE, I. P., HEEMSTRA, L. C., & MILLER, C. O. (1944). **Acute uremia associated with "uric acid infarcts" in the kidneys of baby pigs.**—*Amer. J. vet. Res.* **5.** 262–273. **573**

The symptoms, pathology, blood chemistry, and analysis of renal tissue are dealt with, in cases of acute uraemia in piglets. Typical cases show symptoms within three days after birth. They lose weight, the coat becomes rough and "staring" and the temperature falls below normal. Diarrhoea is common, and some cases appear hypersensitive, squealing feebly and exhibiting tremors when disturbed. The disease is highly fatal. Considerable quantities of orange-coloured precipitate are observed P.M. in the renal pelvis and papillary tubules, causing a complete impaction. Blood examination shows a considerable increase in urea nitrogen and uric acid; the latter substance also occurs in the kidneys in abnormal quantities. Blood sugar remains within normal limits.

The authors find that enforced fasting has produced a condition similar to acute uraemia in baby pigs, and they suggest that prophylaxis should be based upon stimulating the flow of the sow's milk.

—JOHN G. CAMPBELL.

DIMOCK, W. W., WESTERFIELD, C., & DOLL, E. R. (1944). **The equine thyroid in health and disease.**—*J. Amer. vet. med. Ass.* **104.** 313–317. **574**

The thyroid glands were examined from 59 horses, including 26 foetuses. Data are given for weight of thyroid, body weight, and histological characters, including vascularity, distribution and size of follicles, types of epithelium, and amount and type of colloid.

Four animals with periodic ophthalmia and 15 showing symptoms of incoordination ("wobblers") were included in the series. In three of the former and six of the latter the thyroids were hyperplastic. Frequent use is made of the term "normal" in the tables and text. The authors have presumably taken as a basis the descriptions given in the literature, particularly those of SCHLOTTHAUER [*V. B.* **1.** 150.] and of ABBOTT & PRENDERGAST [*V. B.* **5.** 387]. Of the total of 59 animals the thyroids are classified as:—normal, 27; hyperplastic, 20; colloid, 12 [given as 4 in Table 3].

There is also a table giving weight of thyroids and body weight for 142 horses examined P.M. The ratio of thyroid weight to body weight was highest in the foetus and became progressively lower with increasing age (0·396 g. per kg. body weight, falling to 0·059 g.).

—E. G. WHITE.

PERLMAN, R. M. (1944). **Parathyropituitary syndrome. (Pituitary dysfunction and "primary" hyperparathyroidism).**—*Arch. Path.* **38.** 20–27. [Author's summary copied *verbatim*]. **575**

A dog having atypical eosinophilic adenoma of the pituitary gland presented at autopsy coincident adenomatous hyperplasia of the parathyroid glands and grave chronic nephritis, together with fibrous osteopathy (von Recklinghausen) minus brown cysts. The case and experimental evidence support the concept of a parathyroid-pituitary relationship with consequent effect on the calcium metabolism.

ROSÀ, F. M. (1943). Agenesia de um rim, uma nova mutação no coelho. [**Agenesia of a kidney—a new mutation in rabbits**].—*Rev. Med. vet., Lisboa.* **38.** 349–363. **576**

Unilateral renal agenesia was found in nine out of 51 descendants of nine breeding rabbits. The condition occurred in two 25-day foetuses, two stillborn animals, and five animals which died of coccidiosis, two being females of 43 and 159 days old respectively, and three males of 25, 34, and 206 days old respectively.

Renal agenesia therefore appears to be a genetic fault. The gene in question affects both metanephron and mesonephron, but of one kidney only.—I. W. B.

HUMMON, O. J., & BUSHNELL, F. R. (1943). **Studies of cotton minks with reference to heredity and blood elements.**—*Amer. Fur. Breed.* **16.** No. 5. 30, 32 & 34. **577**

The condition of "cotton", which renders the pelts of affected minks worthless, was studied through three breeding seasons. It was not found to be hereditary, even when close interbreeding of male and female cotton minks was carried out. No change relative to the condition was observed in numbers of erythrocytes or leucocytes or in the amount of haemoglobin in the blood.—D. N. SPRIGGS.

JEFFREY, F. P., & PINO, J. (1943). **The effects of heredity and of certain environmental factors on the incidence of blood spots in chicken eggs.**—*Poult. Sci.* **22.** 230–234. **578**

An examination was made of 2,380 eggs from 238 pullets, the progeny of six cocks and 22 hens; the eggs were broken in order to identify blood spots with certainty. 110 pullets were placed in individual laying cages and 128 were kept under normal conditions in open-

front houses. Rations were the same for both groups.

It appeared reasonably clear that the blood spots were primarily dependent upon genetic factors, although the data did not afford any basis for an attempt to evaluate the relative importance of the male and female in this connexion. Wide differences were noted in the percentage of blood spots in eggs produced by the daughters of each of the six cocks, but, at the same time, three of the 22 hens were full sisters and the daughters of these three hens showed a very low percentage of blood spots in their eggs, regardless of the male with which they were mated. The highest incidence in any family was found among 21 daughters produced from one particular mating.

It also appeared that an environmental factor factors were involved, as the incidence of blood spo was much lower in the caged birds than in those ke under ordinary conditions.

A further study involving 144 hens and pullets ar 2,301 eggs showed that the incidence of blood spots d not increase when birds were frightened, a dog bein allowed to chase the birds in the pen.—J. D. Blaxlan

See also absts. **658** (livestock diseases in Iceland), **666** (in Queen land), **667** (in N. Rhodesia), **668** (in Nigeria), **669–672** (in Ugand **673** (in Zanzibar), **674**, **675** (in Br. Guiana), **677** (in Leeward Is **678**, **679** (in Jamaica), **677** (" equine sickness " in Leeward Is **547** (jaagziekte), **667** (pseudo-urticaria of cattle), **589** (nephritis)

NUTRITIONAL AND METABOLIC DISORDERS

Taylor, L. W., Lerner, I. M., & DeOme, K. B. (1944). **An effect of ration on mortality of laying hens.** —*Poult. Sci.* **23.** 181–188. **579**

For four years a pedigree wing-banded flock of chicks was divided at hatching into two groups. A ration composed of a high proportion of yellow maize, fed continuously for the first 18 months of life, produced a significantly higher laying hen mortality than a similar ration in which a large part of the maize had been replaced by barley and alfalfa meal. That this was not due to an increase of vitamin A or other vitamins in the latter ration was indicated by the fact that the vitamin A and riboflavin contents of the livers of certain of the maize-fed birds were higher than those of the barley- and alfalfa-fed birds. The effect of the maize ration in producing an increase in mortality appeared to be dependent upon a cumulative action during both the rearing and laying period, no significant differences being noticed when the rations were changed at five months of age. No definite evidence as to the specific nature of the inadequacy of the maize ration was discovered.

The differences in mortality were primarily accounted for by an increase in pathological conditions of the reproductive tract, such as ruptured and flabby ova, occluded oviducts, reverse peristalsis, and prolapsus.

The maize ration produced more rapid growth and earlier sexual maturity, but the initial advantage was lost by the end of the first laying year owing to the increased mortality.—J. D. Blaxland.

Loosli, J. K. (1944). **Vitamins in calf health.**—*Corne Vet.* **34.** 147–151. **58**

A review article indicating the primary importan of vitamin A in calf nutrition, especially in the imm diate postnatal stage. Reference is also made to th necessity of adequate vitamin C and niacin [= nicotin acid] in the diet of the newborn calf, and of vitamin for normal growth. L. concludes that the recent studi here reviewed suggest that at least a part of the fair considerable calf losses occurring under farm condition may be due to a supply of vitamin A, ascorbic acid, an niacin which is less than that required.—N. J. Scorgi

*—. (1940). De l'acétonémie des vaches laitières place qu'elle pourrait occuper dans la classificatio des affections vitulaires. Notes sur l'acétonémie de brebis. [**Acetonaemia in milch cows and sheep**].— *Bull. Acad. vét. Fr.* **13.** 125–129. [Abst. from abs in *Jber. Vet.-Med.* **71.** 108]. **58**

In the district of Caux (lower Seine), ketone bodie are present in the urine of all cows before and afte parturition during the period of shortage of dry fodde (end of February to the beginning of March). Th amount increases up to the time of parturition and fo a short time afterwards. There are four possible cause of the acetonaemia, *viz*, indigestion, insufficient foo intake, lack of fats, and liver insufficiency. The relation ship to milk fever is uncertain.—J. G. Carr.

See also absts. **675** (deficiency disease of cattle in Br. Guiana), **5** (thiamine and poliomyelitis), **480** (bacterial action on riboflavin **600** (cod liver oil and vitamin E).

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

Brody, S., Kibler, H. H., & Ragsdale, A. C. (1942). **Growth and development with special reference to domestic animals. LV. Resting energy in relation to body weight in growing Holstein cattle.**—*Res. Bull. Mo. agric. Exp. Sta.* No. 350. pp. 14. [See also *V. B.* **14.** 167]. **582**

This bulletin presents data on the resting maintenance-energy cost (" resting metabolism ") and ventilation rate (air inhaled or exhaled per minute) in relation to body weight in growing Holstein heifers during the first two postnatal years. The results and conclusions for Holsteins are identical with those for Jersey cattle described in detail in a previous report [(1941). *Res. Bull. Mo. agric. Exp. Sta.* No. 335. pp. 20]. By employing an equation fitted to the data by the method of least squares, it was found that the differential percentage increase in resting maintenance cost is about 0·6 times as rapid as the percentage increase in body weight. The resting metabolism per unit surface is somewhat higher in the Holsteins than in the Jerseys. The general trend of the ventilation rate tends to vary with the 0·77 power of the body weight.—N. J. Scorgie.

Comstock, R. E., & Winters, L. M. (1944). **Th development of body form in swine.**—*J. Anim. Sc* **3.** 188–193. **58**

Observations on pigs indicated that their conforma tion changes throughout the course of growth [se McMeekan—*J. agric. Sci.* **30.** 276. (1940)]. Th present authors, from a series of measurements of bod length, depth behind the shoulders, width behind th shoulders, and width of loin confirm this generalizatio and from these measurements studied according to sex breed, and genealogy, they produce evidence to sho that the course of change in form is subject to genetic a well as to environmental factors. It was found that boar and barrows (castrated males) followed different paths o development with respect to conformation. Th authors suggest that it would be more logical to evaluat conformation only at market weight (195–250 lb.) an to shift the emphasis now placed on type at other age to direct selection for such characteristics as fertilit and rate of gain.—N. J. Scorgie.

Comstock, R. E., Winters, L. M., & Cummings, J. N

(1944). **The effect of sex on the development of the pig.**—*J. Anim. Sci.* **3.** 120–128. **584**

Data on the growth rates of 1,602 pigs from seven Poland China lines and of 795 from the Minnesota No. I strain were utilized in a comparative study of gilts and barrows (castrated males). The estimated sex difference in rate of growth from weaning to 200 lb. was ·039 lb. per day in the Poland Chinas and ·089 lb. in the No. I line. The two were significantly different. The contrast is believed to be due to the earlier appearance of oestrus (at 112–140 days of age) in the No. I line as compared with the Poland China lines (never before 168 days), and it is assumed that the onset of puberty retards the growth of gilts. Significant variation in the sex differences of the progenies of different sires (sex-sire interaction) suggests the presence in the No. I line of a segregation of genes concerned with the effect of sex on the growth rate. The sex difference in growth rate increased with age in both groups, the increase being significantly greater in the No. I line. The authors discuss the implications regarding the effect of selection for growth rate on age of puberty. They state that there can be little doubt that if puberty occurs too late, the reproductive performance of both sexes will be unsatisfactory in their first breeding season. In at least one of the Poland China lines studied, late sexual maturity interfered with reproductive efficiency. The possibility, therefore, that selection for growth rate may have an adverse effect on age of sexual maturity deserves consideration when the development of superior lines of swine is being attempted.—N. J. SCORGIE.

BEDEL, L. (1943). 'Température rectale des veaux à leur naissance. **[Rectal temperature of calves at birth].**—*Rec. Méd. vét.* **119.** 117. **585**

B. gives the rectal temperature of calves at birth as varying from 39°–40·5°C., with an average of 39·6°C. It is always higher by about 0·8°C. than the temperature of the dam (average 38·6°C.). When the temperature of the dam is above normal, that of the calf shows a corresponding rise. Premature calves born alive also show a higher temperature than that of the dam, but it is not greatly different from those born at full term. Calves born dead have a higher temperature by 0·2°–1·0°C. than that of the dam, unless they have been dead for some time, when it is lower by 0·7°C. on the average. The rectal temperature of dead calves *in utero* never falls below 38°C. B. suggests that the rectal temperature gives an indication of the time of death *in utero*, especially when the state of the cornea is also noted.

—JOHN G. CAMPBELL.

PETERSEN, W. E. (1944). **Lactation.**—*Physiol. Rev.* **24.** 340–371. **586**

This review deals chiefly with the more recent literature on the physiology and biochemistry of lactation. The following phases of lactation are discussed :– (a) mammary development—roles of pituitary, ovarian, placental, thyroid, and adrenal hormones ; (b) secretion of milk—endocrine factors, time of milk secretion, physico-chemical aspects, biochemistry of milk synthesis, and (c) evacuation or "letting down" of milk. There is a bibliography of over 350 references.

—ALFRED T. COWIE.

WILSON, S. J. (1944). **Qualitative and quantitative studies on the antithrombic activity of blood serum and plasma.**—*Amer. J. clin. Path.* **14.** 307–315. [Author's conclusions copied *verbatim*]. **587**

Thrombin is neutralized or inactivated by both serum and plasma and the antithrombic activity of each is essentially the same when quantitative determinations are made. There is, however, a definite qualitative difference in the antithrombin of serum and plasma, these changes being dependent upon the quantity of thrombin inactivated during the coagulation process.

The antithrombic titer is elevated when heparin is added to plasma, the increase in the titer being dependent upon the degree of heparinization. When heparin is added to serum the degree of increase in antithrombin is dependent upon the quantity of thrombin previously inactivated by the serum. The greater the quantity of thrombin previously inactivated the less the amount of antithrombin created upon the addition of heparin.

When heparinized plasma is allowed to clot the heparin-elevated antithrombic activity drops to the previous normal level at which time the rate of thrombin inactivation returns to the usual rate.

The antithrombic activity of plasma is due to two factors ; the adsorption of thrombin by the heparinized part of the most soluble portion of the albumin fraction and the adsorption of thrombin directly onto the soluble albumin.

When the antithrombin of serum is observed the antithrombic activity of the heparin-albumin combination may be missed entirely. Only plasma should be used to determine quantitatively the antithrombic activity due to heparin.

SILBERBERG, M., & SILBERBERG, R. (1944). **The effects of 3,4 benzpyrene on wound repair in the skin of mice.**—*Amer. J. Path.* **20.** 809–822. [Authors' summary copied *verbatim*]. **588**

In the skin of normal mice, wound repair takes place primarily by proliferation and hypertrophy of the epidermis adjoining the wound and by movement of the epithelium into the defect. These processes are hastened by the application of benzene to the skin previous to the making of the wound. Under the influence of benzpyrene applied for 2 weeks previous to excision, both components of wound healing are likewise accelerated. After prolonged treatment with benzpyrene, proliferation of the epidermal cells is further intensified, whereas cell migration into the defect is inhibited or almost suspended.

WILMER, H. A. (1944). **Renal phosphatase. The correlation between the functional activity of the renal tubule and its phosphatase content.**—*Arch. Path.* **37.** 227–237. **589**

Alkaline phosphatase in the kidney is confined to the proximal convoluted tubules and a portion of the ascending loop of Henle. The phosphatase can be demonstrated in histological sections by the methods described independently by GOMORI and by TAKAMATSU in 1939. Using this technique, W. has attempted to correlate enzyme activity with tubular function.

Complete obstruction of the ureter in the cat and rabbit causes decrease in phosphatase in the corresponding kidney. Temporary occlusion of the renal artery, ligation of the renal vein, or permanent partial constriction of the left renal artery—three procedures which cause unilateral renal ischaemia—cause only a slight reduction in renal phosphatase.

Aglomerular toadfish (*Opsanus tau*) kept in captivity have no renal phosphatase and this is probably related to their inability to secrete sugar.

Phosphatase is probably concerned in the reabsorption of glucose by dephosphorylating hexose phosphates, and diminution of the enzyme in kidneys in which tubular function is disturbed (by hydronephrosis, interstitial nephritis, or ligation of the intrarenal pelvic papilla) probably reflects reduction of glomerular filtration and tubular reabsorption.

There is a useful review of the literature with 45 references.—E. G. WHITE.

KINGMAN, H. E. (1944). **The uterine wall of the cow.**—*Amer. J. vet. Res.* **5.** 223–227. **590**

This is a general account of the anatomy and physiology of the uterus. There are no references and no new material is presented, but there is an attractive coloured chart which represents schematically the effects of the various hormones on the reproductive organs and mammary gland of the cow at different stages of the oestrous cycle and during gestation and the puerperium.—E. G. WHITE.

LASLEY, J. F., & MAYER, D. T. (1944). **A variable physiological factor necessary for the survival of bull spermatozoa.**—*J. Anim. Sci.* **3.** 129–135. **591**

Differences are confirmed in the ability of undiluted spermatozoa from range bulls in Arizona on the one hand and from beef bulls in Missouri on the other to survive under controlled storage conditions [see also *V. B.* **13.** 256]. When, however, the semen was diluted with egg-yolk phosphate buffer there was little or no difference in the average percentage of live sperm from the two groups of bulls, after 144 hours' storage at 8–10°C. These observations suggested that the presence or absence of some physiological factor might explain the general effect of egg-yolk diluent on spermatozoa and the anomalous behaviour of bull spermatozoa in this medium reported by different investigators. In an endeavour to measure the resistance of sperm to adverse environmental conditions, a cold-shock technique was adopted. As in the storage experiments, the ability of the spermatozoa in undiluted semen to survive the cold-shock treatment was considerably less in the samples collected from Arizona than in those from the Missouri group of bulls, and again the difference in the resistance of the spermatozoa from bulls of the two localities was eliminated by the addition of egg-yolk diluent. The ability of epididymal spermatozoa from bulls in Arizona to survive a cold shock was also measured and was found to be considerably greater than that of freshly ejaculated spermatozoa both in diluted and undiluted semen.

From their data, the authors postulate that the survival of bull spermatozoa is dependent primarily upon a variable physiological factor which is responsible for, or influences, their resistance to environmental conditions. The data also show that a relationship exists between the survival time of bull spermatozoa under storage conditions and the degree of their resistance to a low-temperature shock. Results obtained in this investigation suggest that the storage potentialities of undiluted semen are dependent upon the number of resistant spermatozoa present at the time of ejaculation. Further, it is suggested that the storage potentialities of semen diluted with egg-yolk are dependent upon the number of spermatozoa, in addition to those resistant at ejaculation, possessing the ability to become resistant in the presence of egg-yolk.—N. J. SCORGIE.

LIPSCHÜTZ, A., QUINTANA, U., & BRUZZONE, S. (1944). **Differential behaviour of the liver towards natural and artificial estrogens.**—*Proc. Soc. exp. Biol., N.Y.* **55.** 43–45. **592**

Artificial oestrogens, such as diethyl stilboestrol and hexoestrol, are less readily inactivated by the liver than are naturally occurring oestrogens. Synthetic oestrogens thus have prolonged effects and will induce abdominal fibroids when introduced as pellets into the spleen of g. pigs.—E. BOYLAND.

SMITHCORS, J. F., & LEONARD, S. L. (1943). **Limited effects of certain steroid hormones on mammary glands of hypophysectomized rats.**—*Proc. Soc. exp. Biol., N.Y.* **54.** 109–111. **593**

Male and female immature rats were hypophysectomized when 26–38 days old (50–98 g. body weight). Sixty-one completely operated animals were used in the experiments. When progesterone injections of 3 mg. per day were commenced immediately after hypophysectomy, growth of the end buds and slight thickening of the mammary ducts were observed; the effect of smaller dosages (1·5 mg.) was less obvious. If the injections were not commenced until 4–8 days after the operation, no stimulation of the glands was observed. The administration of 1–3 mg. progesterone in combination with 5 μg. α-oestradiol dipropionate immediately after hypophysectomy produced marked stimulation of the lateral and end buds and thickening of the ducts; with the oestrogen alone there were fewer end buds and no enlargement of the ducts. No growth was observed when the combined injections were commenced 4–8 days after the operation. Desoxycorticosterone acetate in daily doses of 0·75–1·0 mg. had no effect on the glands.

It is emphasized that although the mammary glands of hypophysectomized rats may be stimulated by certain steroids, the development does not approach that found in the normal animal and it is concluded that adequate pituitary hormones are necessary to produce a fully developed gland.—ALFRED T. COWIE.

REINEKE, E. P., & TURNER, C. W. (1944). **Non-permeability of the mammary gland to thyroid hormone.**—*J. Dairy Sci.* **27.** 793–805. [Authors' summary copied *verbatim*]. **594**

In view of the recent development of highly active synthetic thyroprotein (Protamone) and the possible use of this product for stimulation of increased lactation in dairy cattle, a series of experiments were conducted to determine whether cows fed "Protamone" would transmit any thyroidal substance in their milk.

In one experiment guinea pigs were given approximately 100 ml. of milk daily for two weeks from cows receiving massive doses of "Protamone". In a second trial with guinea pigs, milk from cows receiving a moderate dose of "Protamone" was fed for six weeks. Frequent determinations of metabolism during both experiments failed to show any significant differences between these animals and paired controls receiving a normal milk diet, or normal guinea pigs on a stock diet. Responsiveness of the guinea pigs to thyroidal stimulation was shown by the fact that the experimental group while still on the milk diet showed a 25 per cent increase in metabolism when 2·5 micrograms of l-thyroxine was injected daily for two weeks.

In a similar experiment with thyroidectomized goats no metabolic stimulation or subjective improvement of the cretinism could be detected as a result of feeding milk from "Protamone-fed" cows for two weeks. These animals responded markedly, however, when $\frac{1}{4}$ gram of "Protamone" daily was fed directly.

No elevation of the basal metabolism could be detected when a quart of milk daily from "Protamone-fed" cows was consumed by two human subjects. Significant elevation of the basal metabolic rate occurred when $\frac{1}{2}$ to 1 grain of "Protamone" daily was given orally.

On the basis of these experiments it was concluded that the mammary gland does not permit passage of biologically detectable amounts of thyroidal hormone when "Protamone" is fed to lactating cows.

WILLIAMS, R. G. (1944). **Some properties of living thyroid cells and follicles.**—*Amer. J. Anat.* **75.** 95–119. **595**

By microdissection experiments in living mice and rats and by studying autogenous thyroid grafts in

abbits, W. investigated the physical relationships of the hyroid cells and the physical properties of the colloid. The properties of the colloid and of the cells when bserved *in vivo* are shown to differ somewhat from hose observed in isolated pieces of gland. It is believed hat the thyroid cells only secrete towards the lumen of the vesicle; no indication of basal secretion was obtained. From the behaviour of the diazo dye T-1824 when injected into a vesicle, it is deduced that the contents of the vesicles may reach the tissue fluids by a process of diffusion and that utilization of the colloid is not necessarily associated with visible changes in cell structure or in colloid volume. The functional significance of the various observed phenomena is discussed.—ALFRED T. COWIE.

DAVIDSON, J. L. (1944). **Influence of the adrenal cortex hormones on carbohydrate and protein metabolism.**—*J. Amer. vet. med. Ass.* **104.** 336–338. **596**

A concise review of some of the recent advances made in the study of the physiological actions of the adrenal cortical hormones on carbohydrate metabolism and electrolyte balance.—ALFRED T. COWIE.

HÖSER, J. (1941). Altersveränderungen der Hypophyse des Pferdes. 4. Beitrag zur Altersanatomie des Pferdes. **[Age anatomy of the horse. IV. Age changes of the pituitary body of the horse].**—*Z. Altersforsch.* **3.** 113–125. [Abst. from abst. in *Jber. Vet.-Med.* **70.** 435]. [Parts 1 & 2 not traced; part 3 (*Inaug. Diss., Hanover* (1941), not available]. [See also *V. B.* **13.** 258]. **597**

The climax of pituitary growth is reached at puberty. With increasing age the following structural changes were noted:—widening of the sinus capillaries in the glandular area, uneven distribution of cells with atrophy in old age, and the presence of acidophilic colloidal areas. No increase in connective tissue was observed. It is considered that adenomatous and hyperplastic conditions are not uncommon in horses from about the age of eight years.—C. W. OTTAWAY.

See also absts. **574** (equine thyroid), **575** (parathyroid-pituitary relation and Ca metabolism), **655** (bone-marrow infusion), **681** (vertebrate photoreceptors).

POISONS AND POISONING

PARKER, J. R., & SCHWEIS, G. G. (1944). **Toxicity of sodium fluosilicate to livestock, poultry, and game.**—*J. econ. Ent.* **37.** 309–310. **598**

The authors show that neither animals nor birds will voluntarily consume a lethal dose of a bait, used for the destruction of crickets, containing 4 lb. of sodium fluosilicate to 100 lb. of bran. Forced feeding of 18·2 grammes of sodium fluosilicate (equivalent to 1 lb. of bait) did not cause symptoms in a sheep, but twice this quantity was found to be fatal. Another bait comprising 2 oz. of bran and 2·37 ml. of sodium arsenite solution (32% arsenious oxide) produced no symptoms when forcibly fed, but double this dose caused death in a sheep.—J. O. L. KING.

SWEETMAN, H. L., & BOURNE, A. I. (1944). **Toxicity of natural and synthetic cryolites to rats.**—*J. econ. Ent.* **37.** 299–300. **599**

The authors found that cryolite fed to rats did not produce toxic symptoms. Sodium fluosilicate was definitely toxic to rats when fed at the rate of 300 mg. per kg. body weight. Sodium fluosilicate applied to the floor of the cage killed a rat after prolonged exposure. —G. D. S.

SCORGIE, N. J., & MILLER, W. C. (1944). **Further investigations on the alleged toxicity of cod-liver oil for pigs.**—*Emp. J. exp. Agric.* **12.** 74–82. **600**

In this experiment, four different samples of cod liver oil, one of dogfish oil, and one of sperm oil were fed up to 4 oz. per head per day to pigs 20–140 days old. No evidence was obtained that the pigs developed degenerative changes of the skeletal muscles (muscular dystrophy) resulting from destruction of vitamin E by the cod liver oil, as has been reported on herbivorous animals. P.M. examination confirmed the clinical observations, and histological examination of sections of heart muscle, liver and diaphragm did not reveal any abnormality. Feeding of 4 oz. of cod liver oil per head per day caused marked growth retardation in three of four pigs 54–80 days old. It is suggested that the growth retardation may have been due to a mechanical laxative action to the excessive amount of cod liver oil rather than to a specific growth-retarding factor present in the oil.—G. D. S.

MEZEY, K. (1943). Phytolacca Australis—"Guaba". Estudio toxicóolgico y farmacodinámico. **[Toxicology of** *Phytolacca australis***].**—*Rev. Med. vet., Bogotá.* **12.** 101–107. **601**

Guaba, or *Phytolacca australis*, has long been used empirically in the treatment of inflammatory conditions. The plant, however, is toxic, and contains saponins, phytolaccic acid, potassium, and a small amount of oil of mustard. The poisonous effects of the plant on experimental animals may be attributed to the saponin content. Since saponins are largely destroyed by the gastro-intestinal enzymes, the lethal dose by the oral route is much larger (15 times) than the intravenous lethal dose. The saponin has a destructive effect on the central nervous system and on the lipoidal material of the cell-membrane of the red blood cells.

Symptoms of poisoning include slow respirations, bradycardia, and convulsions followed by prostration. Guaba poisoning should be treated by the intravenous administration of calcium gluconate, strychnine sulphate, and barium chloride.—ISOBEL W. BROCKLEHURST.

WILSON, F. (1943). **The entomological control of St. John's wort (*Hypericum perforatum* L.), with particular reference to the insect enemies of the weed in southern France.**—*Bull. Coun. sci. industr. Res. Aust.* No. 169. pp. 87. **602**

An account of *H. perforatum* is given, including its harmfulness as a weed, its poisonous properties, its habits of growth, and its injurious effects on pasture grasses. The failure to establish certain British insect enemies of the plant in Australia led to an investigation of the insect enemies of this weed in southern France where the climate is more like that of south-eastern Australia. This paper deals with the distribution of *Hypericum* insect parasites, their life-histories in southern France, their parasites and other limiting factors, and their effect upon the host plant. The principles of entomological weed control are discussed briefly on the basis of evidence derived from this investigation. Three insect enemies of St. John's wort have been established in Australia and it seems likely that they will later control the weed to a useful degree. They are the beetles, *Chrysolina hyperici*, *C. gemellata*, and *Agrilus hyperici*.—B. JOHNSTON (AUSTRALIA).

See also absts. **666** (poison plants of Queensland), **667** (of N. Rhodesia), **642**, **643** (food poisoning).

PHARMACOLOGY, THERAPEUTICS AND DISINFECTION

—. (1944). **Penicillin.** pp. 127. Rahway, N.J.: Merck & Co. [4to]. **603**

This is a well documented monograph on what has become an important branch of chemotherapy. The anonymous author or authors have studied the subject carefully and deal with 303 publications. Although this monograph was published in June of last year, it is already out of date since several important points have been revealed recently.

After a brief historical note, the standardization and production of penicillin are described. There is no reference to commercial large-scale production or to the production of material containing more than 0·5 Oxford units per μg. (The International Standard penicillin contains 1·66 units per μg.) Penicillin is effective against Gram-positive organisms both *in vitro* and *in vivo*. In general, its potency is about 1,000 times greater than that of the sulphonamides. It is relatively inactive against Gram-negative bacteria, yeasts, and fungi. Although it is bactericidal, even high concentrations of penicillin require at least 12 hours to kill 99% of organisms in *Staphylococcus aureus* cultures. With low concentrations, the inhibitory action is proportional to the logarithm of the concentration. The inhibitory effect is not influenced by the presence of serum, blood, pus, or tissue autolysates. Penicillin causes morphological changes in organisms. Bacteria may become adapted to penicillin and sometimes lose virulence during adaptation. Penicillin is destroyed by penicillinase, an enzyme present in many bacteria.

The results of animal tests and clinical trials are given in some detail. In addition to its effect in bacterial infections, penicillin has been found to protect mice against *Treponema novyi* (the spirochaete of American relapsing fever) and against the virus of ornithosis. It is effective against syphilis but not against malaria. Penicillin has very slight pharmacological effects. It is destroyed in the stomach and rapidly excreted in the urine. It does not penetrate into the cerebrospinal fluid. It is said to be the best therapeutic agent for all infections with staphylococci, clostridia, haemolytic and anaerobic streptococci, pneumococci, gonococci and meningococci.

The monograph gives full details of the methods used for assay of penicillin and most of the published results of experiments with penicillin *in vitro* and *in vivo* in man and animals are given in tabular form.—E. B.

SCHMIDT, W. H., & MOYER, A. J. (1944). **Penicillin. I. Methods of assay.**—*J. Bact.* **47.** 199–208. **604**

In the cylinder plate method, introduced by FLOREY *et al.* in 1941 and recommended by the present authors, the assay is dependent upon (a) the depth of the agar plate, (b) the pH of the medium, (c) the concentration and nature of the test organism, and (d) the condition of the glass cylinders. In both the cylinder plate method and the serial dilution method, it is recommended that the medium be at pH 6·0. In the serial dilution method, 0·045 Oxford units per ml. broth will inhibit growth for 18 hours and 0·1 unit per ml. will inhibit for 40 hours.—E. BOYLAND.

T'UNG, T. (1943). **Concentration and preservation of crude penicillin.**—*Proc. Soc. exp. Biol., N.Y.* **54.** 103–105. **605**

Solutions of penicillin can be concentrated by distillation at reduced pressure. The crude material can be kept at −76°C. for months without loss of activity, but half of the original activity is lost in one month at 5°C.—E. BOYLAND.

THOMAS, A. R., Jr., LEVINE, M., & VITAGLIANO, G. R. (1944). **Simplified procedures for ascertaining concentration of and bacterial susceptibility to penicillin.**—*Proc. Soc. exp. Biol., N.Y.* **55.** 264–267. **606**

Penicillin can be estimated by placing solutions on infected agar plates with a platinum loop and measuring the diameter of the zones of growth inhibition after about 20 hours' incubation. [The method differs from the cup method in that the penicillin solution is applied with a platinum loop instead of being placed in a glass cylinder on the agar.] The resistance of different organisms to penicillin is determined by measuring the growth under the standard conditions. Treatment of infections with penicillin only appears to be satisfactory if the growth of the organism involved is inhibited by 0·1 Oxford units per ml.—E. BOYLAND.

BRYSON, V., SANSOME, E., & LASKIN, S. (1944). **Aerosolization of penicillin solutions.**—*Science.* **100.** 33–35. **607**

Aerosols of the sodium salt of penicillin were produced by dispersing a solution (containing 5,000 Oxford units per ml. in M/50 phosphate buffer at pH 7·0) with a standard glass nebulizer operated by compressed air. The average particle diameter was 1·08μ. Such aerosols were stable and could penetrate through the nose of a rabbit into the lungs. Penicillin administered in this way was recovered to the extent of 60% in the urine.—E. BOYLAND.

OXFORD, A. E. (1944). **Diplococcin, an anti-bacterial protein elaborated by certain milk streptococci.**—*Biochem. J.* **38.** 178–182. **608**

Some acid-producing streptococci inhibit the action of other streptococci which are used as cheese "starters". This inhibition was shown by WHITEHEAD to be due to a protein-like substance which O. has called "diplococcin". The activity of diplococcin was measured by its effect on the growth of a cheese starter (*Str. cremoris*). Diplococcin was isolated from culture of streptococci and shown to be a polypeptide containing no sulphur or phosphorus. It is similar to gramicidin and tyrocidine.—E. BOYLAND.

I. JENSEN, K. A., & SCHMITH, K. (1942). Zusammenhänge zwischen chemischer Konstitution und bakteriostatischer Wirkung bei Sulfonamiden. **[Relation between the chemical constitution of sulphonamides and their bacteriostatic action].**—*Z. ImmunForsch.* **102.** 261–298. **609**

II. JENSEN, K. A., & SCHMITH, K. (1944). Zusammenhänge zwischen chemischer Konstitution und bakteriostatischer Wirkung bei Sulfonamiden. Nachtrag. **[Relation between chemical constitution and bacteriostatic action of sulphonamides. Supplement].**—*Ibid.* **105.** 40–48. **610**

I & II. For typical sulphonamide action, defined as a bacteriostatic effect neutralized by *p*-aminobenzoic acid, an amino group joined directly to a benzene ring in the *para* position to a sulphone group is essential. Thus the sulphide and sulphoxides corresponding to the active 4 : 4′-diaminodiphenyl sulphone are inert. If the acidity of the sulphonamide group is increased (*e.g.*, in sulphathiazole), the bacteriostatic action is greater. The authors suggest that sulphonamides displace *p*-aminobenzoic acid from an enzyme. [That the definition given above is not correct is shown by the behaviour of 4 : 4′-diamino benzophenone.]—E. B.

KAKAVAS, J. C. (1944). **Penicillin in the treatment of bovine mastitis. A preliminary report.**—*N. Amer. Vet.* **25.** 408–412. **611**

Crude penicillin infusions into the udder appear to be effective against streptococcal mastitis and, to a less extent, against staphylococcal mastitis. The crude

material from moulds grown on liquor in which maize has been steeped is extremely irritant, but that from whey-broth medium is not. Sodium penicillin infused into the udder has no local toxic action. Penicillin is not effective against Gram-negative organisms. The optimum dosage and the optimum frequency of treatment have not yet been worked out; in the present experiment, four infusions each of 1,000 Oxford units at daily intervals were generally effective against streptococcal infections.—E. BOYLAND.

RICHOU, R., & HOLSTEIN, G. (1943). L'anatoxithérapie staphylococcique en médecine vétérinaire. Résultats obtenus chez le cheval dans le traitement des maux de garrot et des maux de croupe et de nuque. **[Staphylococcus anatoxin therapy for fistulous withers and " poll-evil "].**—*Bull. Acad. vét. Fr.* **16.** 206–212. **612**

The authors report rapid cure of many longstanding and refractory cases of " poll-evil " and fistulous withers by means of subcutaneous injections of increasing doses of staphylococcal anatoxin, given at intervals of 4–5 days. Treatment was combined with the usual local measures, sulphonamide therapy, and surgical interference when necessary.

Satisfactory results are also reported in the treatment by this means of other suppurative conditions in the horse, such as sinusitis, synovitis, arthritis and lymphangitis.—ISOBEL W. BROCKLEHURST.

ARMSTRONG, A. R., RAE, M. V., LUCAS, C. C., & GREEY, P. H. (1944). **Effect of promin on experimental tuberculosis.**—*Amer. Rev. Tuberc.* **50.** 160–162. [Spanish summary]. [Authors' English summary copied *verbatim*]. **613**

Promin (sodium salt of p,p′-diamino-diphenylsulphone-N,N′-dextrose sulfonate), under strictly defined experimental conditions, influences favorably the course of experimental tuberculosis in guinea pigs.

T'UNG, T. (1944). *In vitro* **action of penicillin alone, and in combination with sulfathiazole, on** *Brucella* **organisms.**—*Proc. Soc. exp. Biol., N.Y.* **56.** 8–11. **614**

Penicillin inhibited the growth of several strains of *Brucella suis* and *Br. abortus*, but had less effect on *Br. melitensis*. The inhibitory action was increased by combination with sodium sulphathiazole. Sulphathiazole alone had only a slight action.—E. BOYLAND.

VORONOV, D. L. (1941). Lechenie strigushchevo lishaya u loshadi. **[Treatment of ringworm in horses].**—*Trud. XV Plen. vet. Sekt. Akad. sel'khoz. Nauk, Moscow, 1939.* [*Diseases of Horses*]. pp. 196–198. **615**

A clinical note. The treatment advocated is the daily application of preparations such as 15–20% alcoholic solution of salicylic acid and 20% creolin ointment.—A. MOLDAWSKY.

FULTON, J. D. (1944). **The prophylactic action of various aromatic diamidines in trypanosomiases of mice.**—*Ann. trop. Med. Parasit.* **38.** 78–84. **616**

The prophylactic action of a number of diamidines was tested in mice infected with *T. rhodesiense* and, in the case of one drug, with *T. congolense*. Each drug was administered either subcutaneously or intraperitoneally in approximately half the maximum tolerated intraperitoneal dose. At weekly intervals after administration the mice were inoculated with the trypanosomes. The results showed that the more active diamidines had a definite prophylactic effect which was, however, of limited duration with a maximum of 2–4 weeks. The effect in general was proportional to the therapeutic activity of the drugs.—D. D. OGILVIE.

ECKELL, O. A. (1943). La sulfaguanidina y la coccidiosis aviar. **[Sulphaguanidine in the treatment of avian coccidiosis].**—*Rev. Med. vet., B. Aires.* **24.** 344–350. **617**

E. reports favourably on the use of sulphaguanidine in avian coccidiosis. His method of administration consisted in dissolving a 0·5 g. tablet of sulphaguanidine in 20 ml. of water and administering the solution *per os* by syringe. On the first day, each bird was given 4 ml. per kg. body weight every four hours. On the second, third, and fourth days, the dose was reduced to 2 ml. per kg. and on the fifth, sixth, and seventh days it was further reduced by 50%. The total dosage for a bird weighing 500 g. was 975 mg. All fowls treated showed improvement in condition, in contrast with untreated controls which all died. Several weeks after treatment coccidia were absent on autopsy.—MILLER WATSON.

BOUHANNA, E. (1942). Au sujet du traitement préventif de la babésiellose bovine par la gonacrine. **[Preventive treatment of bovine piroplasmosis with gonacrine].**—*Arch. Inst. Pasteur Algér.* **20.** 162–164. **618**

In 1940, accidents had occurred in Algeria in the use of the theileriasis vaccine, and owing to transportation difficulties under war-time conditions, immunization of cattle against piroplasmosis was suspended. Heavy losses began to occur in 1941 due to *Babesia berbera* [= *argentina*] infection, outbreaks being most severe towards the end of the autumn. Intravenous injection of 0·5 g. of gonacrine [= acriflavine] in 5% solution into all animals in herds in which the disease made its appearance gave very satisfactory results. It is suggested that infected animals were cured; those in the incubation period apparently acquired some immunity, but those still uninfected might remain susceptible. In view of the existence of uninfected animals, it might be necessary to treat the herd a second time, but after treatment no fresh cases would be likely to occur for 21 days or more.—U. F. RICHARDSON.

STEIGER, P. (1943). Zur Behandlung des bösartigen Katarrhalfiebers mit Merfen. **[Treatment of bovine malignant catarrh with merfen].**—*Schweiz. Arch. Tierheilk.* **85.** 340–341. **619**

Of six cases of malignant catarrh in cattle treated with merfen, two recovered; one of these two, however, received treatment also with acetanilide and named proprietary preparations.—D. L. ROBARTS.

DUNHAM, W. B., & MACNEAL, W. J. (1944). **Inactivation of influenza virus by mild antiseptics.**—*J. Immunol.* **49.** 123–128. **620**

By means of a technique previously described by the authors for vaccine virus, the power of various agents to inactivate influenza virus was studied. Infective allantoic fluid was mixed with suitable dilutions of the agent under test, left for 3 min. and then inoculated into the developing embryo. The titre of the virus suspension was the highest dilution killing at least half the embryos and in no instance was a test considered significant unless the eggs received at least 10 M.L.D. of virus. Preparations which were found to inactivate the virus in 3 min. were as follows:—phenol, 3%; tincture of iodine, 0·1%; copper sulphate, 1%; mercuric chloride, 0·1%; potassium permanganate, 0·1%. Ethyl alcohol, boric acid, thymol, and menthol were also tested.—R. E. GLOVER.

WATERHOUSE, D. F. (1944). **Field and laboratory tests with B.T.B. blowfly dressing and its modifications, with special reference to B.K.B.**—*J. Coun. sci. industr. Res. Aust.* **17.** 1–15. [Abst. from author's summary]. **621**

A cheap, easily prepared dressing to be used on

fly-struck sheep has long been needed in Australia. It must be stable and penetrate the wool readily without staining or damaging it. It should be toxic to the maggots but not to sheep, and should promote healing of the wound and prevent restrike. Tests with six of the most promising dressings showed the superiority of B.T.B.15, the boric acid, tar oil, and bentonite dressing of LENNOX [see *V. B.* **12.** 613]. Since the recommended tar oil had become unavailable owing to war-time conditions it was replaced by a mixture of equal parts of power kerosene with either creosote 259 or middle oil 43. These proved the most satisfactory of a number of substitutes tested, but the contact toxicity of the dressings was low. A dressing B.K.B., containing 20% of a mixture of *o*-dichlorbenzene, lysol, and kerosene, is described; it has very high contact toxicity, stability, and powers of penetration, and is not irritant to the sheep. Tests with a number of bentonites as a constituent of B.T.B. demonstrated the superiority of processed American clays over all other samples.

DESALBRES, & LABATUT. (1943). Contribution à l'étude de la lutte contre l'hypodermose des bovidés. Activation par le terpinéol soluble du pouvoir parasiticide à l'égard des larves d'hypoderme, de la nicotine, du paradichlorobenzène et du sulfate de nicotine. **[The control of ox warbles. Activation by terpineol emulsion of the larvicidal action of nicotine, *p*-dichlorbenzene, and nicotine sulphate].**—*Bull. Acad. vét. Fr.* **16.** 300–311. **622**

A review of the damage caused by ox warbles to cattle in France is followed by a discussion of the rationale of activating larvicides by the addition of a terpineol emulsion which the authors used as a vehicle for nicotine, nicotine sulphate, and *p*-dichlorbenzene. A solution of 27 parts terpeneol emulsion and 3 parts nicotine per 1,000 gave satisfactory results. Application with a tampon of cotton wool, making sure that a few drops of solution penetrate the hole in the skin, is advised; the removal of the dead larva a few days afterwards promotes rapid healing.—G. B. S. HEATH.

GORDON, R. M., DAVEY, T. H., UNSWORTH, K., HELLIER, F. F., PARRY, S. C., & ALEXANDER, J. R. B. (1944). **Control of scabies by use of soap impregnated with tetra-ethylthiuram monosulphide ("Tetmosol").**—*Brit. med. J.* June 17th. 803–806. **623**

Tetraethylthiuram monosulphide (tetmosol) when combined with soap in 5, 10, and 20% dilutions was found to retain its sarcopticidal properties. The regular use of tetmosol soap protected uninfested rats from *Notoëdres* infestation while they were living in close contact with heavily infested rats. With repeated use, it cured about 80% of established cases of human scabies, but is unlikely to supersede any of the standard methods in use, which result in over 90% of cures.

The incidence of dermatitis following the use of this soap was very low.—W. MOORE.

*WAWERSIG, R. (1943). Erfahrungen mit dem Krätzemittel Favorin. **[Treatment of (human) scabies with "favorin"].**—*Med. Welt.* pp. 432–433. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **144.** 430]. **624**

Owing to restrictions in available materials, a scabies remedy during wartime should be one which does not require a fat constituent. Favorin and moriphen are suitable preparations, except that moriphen produces an irritation of the sensitive areas of skin. Satisfactory results were obtained with favorin in 125 cases.

—T. E. GIBSON.

RAO, B. M. (1944). **Treatment of liver fluke infestation in cattle and sheep in Nizam Sagar area with carbon tetra chloride and igitol and their comparative merits.**—*Indian vet. J.* **20.** 235–240. **625**

Eight years' experience is cited. Igitol [a hex chlorethane preparation] seems to be more efficient ar less toxic than carbon tetrachloride. As a rule, igit has been used for animals with suspected calciu deficiency and carbon tetrachloride for other animal Information is given as to doses, methods of administr tion, and precautionary measures.

—G. D. BHALERAO (INDIA

SAETTONE, A. (1943). Tratamiento del Thysanoson Actinioides. **[Treatment of *T. actinioides* infestation** —*Bol. tec. Direcc. gen. Agric. Ganad., B. Aires.* Sec Ganad. No. 9. pp. 609–610. **62**

S. reports the successful treatment of *Thysanoson actinioides* infestation in Patagonian sheep. Each shee received *per os* 4 ml. of extract of male fern [filix ma to which was added 3 drops of croton oil. The do was repeated after six days. Lambs received half th dose. It is claimed that during its elimination by th liver, extract of male fern acts particularly on the par sites in the bile ducts. [Male fern is extremely tox when absorbed, and precautions are generally taken ensure its rapid elimination by the bowel.]—M. W.

PETERS. (1943). Beitrag zur Wurmbehandlung d Truppenpferde. **[Control of worm infestation army horses].**—*Z. Veterinärk.* **55.** 27–28. [Abs from abst. in *Zbl. Bakt. I.* (*Ref.*). **144.** 419]. **62**

Combined treatment with tetrachlorethylene ar allegan removes worms from horses almost completel Tetrachlorethylene in the form of the proprieta preparation "Tetra-spezial", 60 ml. in 1,000 ml. water being administered by stomach tube, followed week later by 30 ml., removes all intestinal parasit except strongyles, including *Gastrophilus* larvae. single dose of allegan greatly decreases the count strongyle eggs in the faeces. The horses are rested the day following treatment, and their food is restricte Well fed, fat animals do not tolerate tetrachlorethyle well.—T. E. GIBSON.

*VIANELLO, G. (1942). Osservazione sull'azione ant elmintica della fenotiazina nelle verminosi del cavall **[Anthelmintic action of phenothiazine in the horse** —*Clin. vet., Milano.* **65.** 123–131. [Abst. from abs in *Jber. Vet.-Med.* **70.** 462]. **62**

No ill-effects were observed to follow the admini tration of doses of 35–40 g. of phenothiazine to horse and 15–20 g. to foals. The efficiency was 90–100 against strongyles and 60–70% against *Oxyuris*.

—H. D. CROFTO

PETERSON, E. H., KAMMLADE, W. G., & WEBB, R. (1944). **The effectiveness of a 1-to-14 phenothiazin salt mixture in controlling nematode infection sheep.**—*Amer. J. vet. Res.* **5.** 228–233. **62**

The 600 ewes used in this experiment were dose with 2 oz. each of a 50% suspension of phenothiazir in water and molasses when they were brought in fro pasture in January, and were divided into three group They had all been dosed with phenothiazine in th previous August, September, October, and Novembe Lambing took place during February to April. O group was put on a 1 : 14 phenothiazine-salt mixtu in January. The second group was dosed with phen thiazine (1 oz. per ewe and ½ oz. per lamb) and ther after put on the phenothiazine-salt mixture at th beginning of the pasture season (April). The thi group was kept as untreated controls. The degree parasitism was estimated by egg counts during life ar by P.M. examination. Records were kept of the ra of gain.

The group maintained continuously on 1 : phenothiazine-salt mixture consisted of 191 ewes ar 157 lambs. They had no direct or indirect conta

with the heavily parasitized untreated sheep and they made a total gain of 8,670 lb. in the ten weeks from May 27th to August 3rd. P.M. examinations of 95 lambs of the group showed parasites to be present, but the progress of the lambs was considered satisfactory. Thus the phenothiazine-salt mixture markedly reduced helminth infestation but did not eliminate it.

The second group, dosed with phenothiazine at the beginning of the pasture season and maintained on the phenothiazine-salt mixture, consisted of 187 ewes and 163 lambs. After a month at pasture, they were placed on a pasture occupied for the previous month by the control group of parasitized untreated sheep. After four weeks on this contaminated pasture, definite signs of parasitism were shown and the animals were again dosed with phenothiazine and placed on a clean pasture. This procedure undoubtedly reduced the losses, but the group only made a total gain of 10 lb. and P.M. examination of 20 representative lambs indicated that the group was heavily parasitized. The control group were favoured by the pasture rotation used and showed less evidence of parasitic infestation than the second group.

The 1 : 14 phenothiazine-salt mixture appears to be effective in protecting sheep from excessive parasitism when they are relatively free from internal parasites and are maintained without contact with other sheep. The mixture does not, however, protect sheep when they are placed upon pasture recently contaminated by parasitized sheep.

The authors discuss these findings and those of others in relation to the control of parasites and suggest that a practical method of control might be as follows. Ewes would be given treatment with the therapeutic dose of phenothiazine before being put out to pasture and would then be maintained at pasture together with their lambs on a 1 : 14 phenothiazine-salt mixture. It might also be necessary to give another therapeutic dose at the end of the pasture season, but further work is required to demonstrate the necessity of this. The best results are obtained when animals are placed on a pasture which has not been occupied by parasitized, untreated sheep during the preceding two months.

—T. E. GIBSON.

MARTIN, A. R. (1944). **The anthelmintic efficiency against sheep nematodes of copper-nicotine sulfate alone, and copper-nicotine sulfate in conjunction with phenothiazine in salt.**—*Cornell Vet.* **34.** 241–247. **630**

The 58 ewes used in this experiment were dosed in May with 1 oz. of a suspension containing 28 g. of phenothiazine and were then placed, together with their 59 lambs, on permanent pasture. They were divided into two groups, the first consisting of 19 lambs and 19 ewes which were given access to a coarse salt mixture. The second group of 39 ewes and 40 lambs was placed on a larger pasture and was given continual access to a 1 : 15 phenothiazine-salt mixture. Both groups remained at pasture until September. Drenching with copper sulphate and nicotine sulphate mixture took place early in July, August, and September, and all the sheep were then placed on dry-lot, all medication ceasing at this time. Records were kept of faecal counts, haemoglobin values, and body weights. As the lambs became fat they were slaughtered and the gastro-intestinal tracts examined for helminths.

The pasture available to the control group was much better than that available to the phenothiazine-treated group and M. considers this to be the explanation of the better average weight gains at pasture made by the controls (28·8 lb. as against 22·7 lb.). At the end of the pasture period, those of the phenothiazine-treated group were discharging fewer nematode eggs (26 per g. of faeces) than the controls (117 per g.), and scours and diarrhoea were more common in the animals of the control group. The phenothiazine-treated group harboured fewer worms, including nodular worms, in the intestines than did the controls. In the dry-lot period, the phenothiazine-treated group gained weight much more quickly than the controls. There was no significant change in the haemoglobin values throughout the experiment. The lambs of the control group consumed an average of 0·416 oz. of salt per day whilst those of the other group consumed 0·24 oz. of mixture containing 0·016 oz. of phenothiazine. Continued consumption of phenothiazine-salt mixture produced no deleterious effects and the worm burden was significantly reduced by the treatment.—T. E. GIBSON.

HARWOOD, P. D., & GUTHRIE, J. E. (1944). **The effect of prickly-ash bark upon the efficacy of phenothiazine against nematodes in fowls.**—*J. Parasit.* **30.** 197. **631**

The bulky dose required and its toxicity to some host species detract from the anthelmintic value of phenothiazine. The authors investigated the possible synergistic action of prickly-ash bark, since its sesamin, sesame oil, and asarinin content have been found to activate the insectidal properties of pyrethrum. Six cockerels were each given 1 g. of the bark together with 0·2 g. of phenothiazine, whilst six controls each received only 0·2 g. of phenothiazine. The table of results shows that the addition of the bark had no apparent effect on the efficiency of phenothiazine against *Heterakis* and *Ascaridia*.—T. E. GIBSON.

FINGER, N. A. (1944). Algo más sobre el bromhidrato de arecolina como antiparasitario del perro. **[Use of arecoline hydrobromide as a parasiticide for dogs].**—*Rev. Med. vet., B. Aires.* **26.** 6–34. **632**

F. studied the value of arecoline hydrobromide as a parasiticide for dogs, particularly as a taeniafuge in *Echinococcus* infestation. The drug was given *per os*, subcutaneously, intramuscularly, or intravenously. Only when given *per os* was it effective as a taeniafuge, and when given parenterally it frequently produced convulsions.

F. did not find that this substance totally evacuated tapeworms, and dogs infested with *Echinococcus* still harboured some worms after treatment. The drug was ineffective in other helminthiases of the dog. F. concludes that the drug is neither very effective nor very safe.—MILLER WATSON.

RAHN, O., & CONN, J. E. (1944). **Effect of increase in acidity on antiseptic efficiency.**—*J. industr. Engng Chem.* Industr. Edit. **36.** 185. [Abst. in *J. Dairy Sci.* **27.** No. 5. A.75, amended]. **633**

Benzoic acid, salicylic acid, and sulphurous acid are nearly a hundred times as efficient antiseptics in strongly acid solutions as they are in neutral solutions. The toxic principle of benzoic and salicylic acids is the undissociated acid molecule. Growth of a wine yeast was completely suppressed when the concentration of undissociated benzoic acid reached 25 mg. per 100 ml. or when 4 mg. of undissociated salicylic acid was present. When sulphurous acid dissociates in water and the concentration of HSO_3^- ions reaches 10 mg. per 100 ml., the HSO_3^- ions inhibit the multiplication of *B. coli* but not of yeast. The rapid death of yeast is brought about by 7 to 8 mg. of undissociated H_2SO_3 per 100 ml.; *B. coli* can tolerate nearly ten times as much.

IVÁNOVICS, G. (1942). Der antiseptische Wirkungsmechanismus verschiedener Benzolderivate, mit

besonderer Rücksicht auf die spezifische Salizylatwirkung. **[The antiseptic action of benzol derivatives, with special reference to the action of salicylates].**—*Z. ImmunForsch.* **102.** 238–258. **634**

The antiseptic action of sodium salicylate on *Staphylococcus aureus* and *Bacterium coli* is neutralized by the addition of pantothenic acid. The bacteriostatic action of sodium benzoate is reduced by the addition of either pantothenic acid or *p*-aminobenzoic acid.

—E. BOYLAND.

SCHMIDT, G. (1942). Ueber die bakterizide Wirkung von Anemonin. **[The bactericidal action of anemonin].**—*Z. ImmunForsch.* **102.** 233–237. **635**

Anemonin, present in the roots of *Ranunculus acris* and *R. bulbosus*, inhibits the growth of staphylococci, the organisms of typhoid and diphtheria, and *Penicillium glaucum*.—E. BOYLAND.

BONET-MAURY, P., PÉRAULT, R., & ERICHSEN, M. C. (1943). Mise en évidence, par la respirométrie, de l'action bactériostatique des radiations ionisantes. **[The bacteriostatic action of ionic irradiation as shown by respiratory studies].**—*Ann. Inst. Pasteur.* **69.** 189–192. **636**

Investigations relating to the effect of radon radioactive emanations on suspensions of *Bacterium coli* indicated that, within certain limits of suitably arranged irradiation doses, it was possible to prepare bacterial suspensions in which the respiratory oxygen consumption remained relatively unaffected while the power of bacterial multiplication was completely destroyed (bacteriologically "sterile" on appropriate culture media).—J. LOCHIEL MCGIRR.

BLUNDELL, G. P., ERF, L. A., JONES, H. W., & HOBAN, R. T. (1944). **Observations on the effect of ultra violet irradiation (Knott technic) on bacteria and their toxins suspended in human blood and appropriate diluents.**—*J. Bact.* **47.** 85–96. **637**

A laboratory study, using Knott's haemoirradiator, was made to test the effect of ultra-violet irradiation on bacteria and toxins in the blood of patients with bacterial infections.

Cultures of bacteria were suspended in both blood and buffered peptone water, exposed in the haemoirradiator, and were then incorporated in agar medium, colony counts being made from poured plates. Except in the cases of *Bacterium coli* and *Pseudomonas aeruginosa*, the difference between the numbers of colonies before and after irradiation was insignificant.

Tests of detoxicating power were carried out by exposing toxins in blood and saline to irradiation and afterwards testing the potency of the toxins in minimal lethal doses, or multiples of that dose, for g. pigs and rabbits. Complete inactivation of toxins did not occur. Irradiation of toxins in saline had a slight detoxifying action on tetanal and diphtherial toxins, but there was no effect on those exposed in blood.—J. M. PETERS.

See also absts. **555** (sulphaguanidine for animals), **455** (sulphanilamide and *p*-aminobenzoic acid), **452**, **453** (ultraviolet prophylaxis of TB.), **475** (arecoline in botulism), **524** (anthelmintics), **528**, **529** (insecticides), **670**, **672** (chemotherapy of protozoan diseases), **558** (neosalvarsan in respiratory diseases of horses), **601** (antidote for guaba poisoning).

HYGIENE AND PUBLIC HEALTH

*KOCH, S. O., & FAULENBORG, G. (1942). Undersøgelser for smitsom Kastning som Led i Maelkekontrollen. **[Examination for brucella infection in connexion with milk control].**—*Maanedsskr. Dyrlaeger.* p. 91. [Abst. from abst. in *Skand. VetTidskr.* **33.** 435]. **638**

The technique of examining bulk samples from milk churns is outlined, the tube agglutination test being used. Results of tests on 519 Danish herds are given, over half the animals in three of them being free from infection.—J. E.

FRAYER, J. M. (1942). **Dye reduction in milk related to Eh, pH, and dissolved gases.**—*Bull. Vt agric. Exp. Sta.* No. 498. pp. 34. **639**

The dissolved gases, the pH, Eh (oxidation reduction potential) and colour changes of resazurin and methylene blue were measured in normal and infected milk. The Eh level for the pink stage of resazurin in reduction is extremely variable, and reduction to the pink stage occurs in most milk samples at reduced oxygen levels. F. considers that all the types of bacteria found in milk have the same effect on dye reduction and depletion of dissolved oxygen. He recommends that the methylene-blue test should be used in preference to any modification of the resazurin test when the process is to be carried out by the average milk-plant operator.—E. BOYLAND.

SKELTON, F. M., & SOMMER, H. H. (1944). **A study of cream rising in milk.**—*J. Dairy Sci.* **27.** 321–330. [Authors' summary copied *verbatim*]. **640**

It was shown that in the creaming of milk the greater portion of the fat rises during the first hour. A slow, gradual rise of residual fat continues indefinitely. There is some indication in the data that during the creaming process the fat content of the skimmilk at one level may be slightly less than the fat content of the skimmilk at a lower level. Indications were obtained that such differences may occur at several points in a skimmilk column suggesting a wave-like progression of the fat. This suggestion should be further verified before it is accepted as a definite conclusion. There appears to be no difference in the manner in which the cream layer forms on raw milk as compared with pasteurized milk.

—. (1944). **Poultry slaughtering.**—*Vet. Med.* **39.** 130–136. **641**

A description is given of the sanitary inspection by the U.S. Army Veterinary Inspection Service of poultry slaughtering, dressing, and distributing establishments which supply the Army. Inspection of well established premises usually entails no special difficulties, but the premises of local dealers wishing to supply an army post or camp are frequently very undesirable. The minimum requirements in equipment and methods to improve the sanitation in order to meet the Army standard, are discussed. There are three photographs illustrating the various steps and processes in a duck-slaughtering establishment.—J. D. BLAXLAND.

SCOTT, W. J., & STEWART, D. F. (1943). **An outbreak of food poisoning due to staphylococci.**—*Med. J. Aust.* Sept. 11th. 211–212. **642**

Fifty-eight persons developed symptoms of shock and vomiting 4–6 hours after the consumption of boiled ham. There were no deaths and recovery was rapid and complete. The hams had been cooked approximately 40 hours prior to consumption. Between cooking and consumption the hams were stored without refrigeration, the mean daily temperature being greater than 80°F. Heavy growths of staphylococci were obtained from 10 of 22 samples examined bacteriologically. Boiled filtrates of three strains cultured suitably were positive to the kitten test.

SANGSTER, C. B., & CONSTANCE, T. J. (1943). **An**

outbreak of food poisoning due to Staphylococcus aureus.—*Med. J. Aust.* Oct. 2nd. 264–266. **643**

An outbreak is described of food-borne disease clinically typical of that caused by staphylococcal enterotoxin. There were 22 affected cases, and the evidence pointed to ham and brawn being the responsible foods. Bacteriological examination yielded pure growths of *Staphylococcus aureus* from both suspected foods. The problem of food storage is discussed.

—D. Forsyth Stewart (Australia).

See also absts. **449-451** (TB. control), **466**, **467** (salmonella), **541**, **542** (trichinosis).

TECHNIQUE AND APPARATUS

Jensen, H. L. (1944). **Bacteriological tests on agar made from Australian seaweed.**—*Bull. imp. Inst.* **42.** 69–74. **644**

A sample of agar prepared from *Gracilaria confervoides* was shown to be quite satisfactory for many routine bacteriological purposes. This agar has the advantage of a tougher, more elastic structure than Japanese agar, and it has a high content of available nutrients.

The disadvantages of the Australian agar include a tendency to allow a more spreading growth of colonies, and defective pigment formation with some organisms. The setting point of the agar is 48°C. so that the medium is inconvenient for the isolation of heat-sensitive bacteria by means of poured plates, and blood plates are rather more difficult to prepare.—I. W. B.

Gildemeister, E., & Heicken, K. (1942). In welcher Zeit erwärmen sich Nährböden in Kulturgefässen im Brutschrank auf 37°C. **[Time taken by culture media to become warm in the incubator at 37°C.]**—*Z. Hyg. InfektKr.* **124.** 341–352. **645**

The times taken for tubes containing 5 or 10 ml. of broth and for petri dishes containing 15 ml. of agar to warm from 16·5°C. to 37°C. were 150 min. and 120 min. respectively. These times were only true for a lightly loaded incubator. The speed of warming depended on the starting temperature of the media and on the size of the stacks of plates. With two plates at a time the interval was 120 min., with three plates, 150 min., with four, 210 min., and with six, six hours. If the incubator was heavily loaded there was a marked delay in the time needed for warming the media to 37°C. The position of the media in the incubator was also significant. At the hind corners and the side walls the warming-up took the least time.—D. L. Robarts.

Humphrey, A. A. (1944). **Use of the buffy layer in the rapid diagnosis of septicemia.**—*Amer. J. clin. Path.* **14.** 358–362. **646**

For the diagnosis of septicaemia, blood is withdrawn from the patient and a culture prepared, and in addition 4–7 ml. of blood are centrifuged at high speed for 30 min. The plasma is pipetted off and a specimen is taken from the layer of leucocytes and platelets ("buffy layer") on top of the red cells and used to make smears which are stained by Gram's method and with Wright's stain. The demonstration of organisms in the "buffy layer" is used for a rapid diagnosis. The method is not a substitute for blood culture, but is supplementary to it. A number of illustrative cases are described in the article.—T. E. Gibson.

Alexander-Jackson, E. (1944). **A differential triple stain for demonstrating and studying non-acid-fast forms of the tubercle bacillus in sputum, tissue and body fluids.**—*Science.* **99.** 307–308. **647**

A modified Ziehl-Neelsen technique is described in which the methylene blue counterstain is removed from all except non-acid-fast tubercle bacilli by treatment with sodium hydrosulphite solution (about 0·25%). The decolorized materials are then counterstained pale green with a stain consisting of equal volumes of 1% aqueous solutions of acid green and acid yellow.

—H. Scott McTaggart.

Rosenthal, W., & Ortega, J. A. (1943). Control microanalítico rápido de soluciones garrapaticidas arsenicales en el campo. **[Rapid method for the analysis of arsenical dips in the field].** pp. 20. Caracas: Instituto de Investigaciones Veterinarias, Ministerio de Agricultura y Cria. **648**

This is a description of the routine method, consisting in the addition of a small quantity of the dip to a mixture of sodium bicarbonate and soluble starch in sodium chloride solution in a large flask. After thorough shaking, an iodine solution is added from a graduated pipette. According to the amount of iodine solution required to produce a blue coloration, the concentration of arsenic in the dip is calculated.—Miller Watson.

Davis, L. R. (1944). **Two new enterotome devices.**—*Amer. J. vet. Res.* **5.** 60–61. **649**

Two ingenious devices for the slitting of bovine intestines for parasitological examination are described and diagrams are given. The first consists of a rod 10 mm. in diameter bent at right angles to give a short arm 60 mm. in length; this arm is tapered, but a knob is left at the end. Half a razor blade is fitted diagonally into a groove made on the inside of the right angle, this being held in place with sealing wax or, better, two small screws. When in use the device is clamped over a sink by means of retort clamps with the short arm pointing downwards. The intestine is then drawn upwards along the short arm of the rod and is cut open by the blade on the inner side.

The second device consists of a curved no. 12 Bard Parker blade upon the point of which has been placed a blob of solder. The prepared blade is attached to a Bard Parker handle and may be used either by holding the knife in the hand or by clamping over a sink like the first device.—T. E. Gibson.

Richards, O. W., Small, J. H., & Collyer, P. W. (1944). **Microscopy with plastic substitutes for cover glasses.**—*Stain Tech.* **19.** 59–62. [Authors' conclusions copied *verbatim*]. **650**

Examination of plastic substitutes for use as cover slips for preparations to be examined with a microscope showed that the thicker ones now on the market are satisfactory when mounted to give a plane surface. Materials optically inhomogeneous, of irregular thickness, that curl or give irregular surfaces, adversely affect the performance of the microscope and should not be used. As the substitutes are softer than glass they must be protected from abrasion. It is recommended that thicknesses of 0·18 mm., and none outside of a range of 0·12 to 0·20 mm. be used. For critical observation with unimmersed objectives of high aperture, the correction collar should be set, for best results, to the position corresponding to the measured thickness of the cover slip, just as would be done with glass cover glasses.

McCartney, J. E. (1944). **A new immersion oil ("Polyric").**—*J. Path. Bact.* **56.** 265–266. **651**

"Polyric" immersion oil consists of a mixture of two parts of best quality castor oil with one part of a synthetic resin referred to as "polymethylstyrene" which is a polymer of α-methylstyrene. The proportions of the two constituents are adjusted to give a

refractive index of 1·515 at 20°C. The advantages of this oil over cedarwood oil are that it is chemically stable, remains neutral in reaction, does not evaporate or thicken, and does not tend to creep.—H. S. McT.

GIUNTINI, J., & LEVADITI, J. C. (1943). Mesure interférométrique de la profondeur des chambres construites pour la numération des particules ultramicroscopiques. **[Interferometric measurement of the depth of chambers constructed for the enumeration of ultramicroscopic particles].**—*Ann. Inst. Pasteur.* **69.** 17–21. **652**

When using quartz chambers for the counting of ultramicroscopic particles in liquid media, it is important to know the exact volume of the fluid in the microscopic field. The area of the field may be calculated for any combination of objectives and eyepieces, but the depth must be measured. This is done by interferometric means, using a binocular microscope. Either transmitted or reflected light may be used; in the former case the cell must be lightly silvered. Details of the method and the formula used are given. In cells said by the makers to be 2–2·5 μ deep, the actual depth was found to vary between 8 and 12μ in different fields.

The method was checked by weighing the volume of water required to fill the cell and also by counting the erythrocytes in blood of known cell count. For accurate results, the depth of the chamber must be measured for each field. The authors consider that the method is then the most accurate known for the counting of ultramicroscopic particles.—R. M. ARNOLD.

MORRIS, C. J. O. R. (1944). **A mains-operated single-cell photoelectric colorimeter.**—*Brit. med. J.* July 15th. 81. **653**

The instrument, which is described in detail with one figure, involves no fundamentally new principle. Recent developments in the design of constant voltage transformers have, however, made it possible to use A.C. mains as a source of power with a constancy of illumination superior to that obtained with storage batteries. Storage batteries may be employed, however, if desired. The extremely high sensitivity of the single-celled instrument makes it possible to use very selective light filters and thus to isolate a narrow spectral band, a property very desirable for certain colorimetric estimations. The instrument can be readily handled by a relatively unskilled operator. It has also been employed as a photo-electric spectrophotometer and it is hoped in the near future to develop a modification for fluorescent measurements.—H. SCOTT MCTAGGART.

SAMUEL, D. M. (1944). **The use of an agar gel in the sectioning of mammalian eggs.**—*J. Anat.* **78.** 173–175. [Author's summary copied *verbatim*]. **654**

Small objects such as mammalian eggs are embedded in an agar gel. This can then be carried through all the stages of dehydration and clearing and, while in methyl benzoate, the eggs may be examined through the agar under an oil immersion lens. Nuclear details may be made out and orientation for sectioning decided. The advantages of serial photography at successive levels ('optical sectioning') as an aid to reconstruction are discussed.

BEHR, G. (1944). **Bone-marrow infusion for infants.**—*Lancet.* **247.** 472–473. **655**

The tibial route is used for prolonged infusions in infants since it is difficult to keep a needle in a vein for a long period. The leg is immobilized by means of a heavy splint, and a special tibial infusion needle is inserted at the level of the tibial tuberosity and is held in position by a strap passing around the leg. A syringe containing a little citrate or infusion fluid is attached to the cannula and a little red marrow is aspirated to make sure that the needle is correctly inserted. The solution is then injected and the prepared infusion unit attached to the cannula. If the cannula becomes loose after several days it should be removed and if the drip is still required, the needle should be inserted in the other leg. It cannot be inserted in another place in the same leg as fluid injected at the second puncture will leak out through the first. The technique is used for the administration of fluids in dehydrated infants and although it could be used for blood transfusions the method is rather slow for this purpose.—T. E. GIBSON.

See also absts. **454** (cultivation of tubercle bacilli), **485** (of *Spirochaeta gallinarum*), **486** (of viruses), **466** (salmonella typing), **445** (preparation of antisera for streptococcus slide-aggln. tests), **499** (haemaggln. titration of influenza virus), **516** (microtitration of antitoxin and agglutinin), **604-607** (penicillin techniques).

MISCELLANEOUS

—. (1943). **United Nations Relief and Rehabilitation Administration. Resolutions and reports adopted by the Council at its first session, held at Atlantic City, New Jersey, U.S.A., November 10 to December 1, 1943.** pp. 90. Cmd. 6497. Miscellaneous No. 6. (1943). London: H.M. Stat. Off. [8vo] [1s. 3d.] **656**

Resolutions of veterinary interest include the following:–

For the first year after liberation of any country, priority is to be given to the production of food for direct human consumption rather than for animal feeding. It is the responsibility of the Administration to provide the supplies and services for cropping, maintenance of dairy herds, and restocking and rehabilitation of farms. The necessary materials to do so will be imported. A technical committee on agriculture is charged with the duties of defining the nature and scope of problems relating to agriculture, food production, and allied subjects in the liberated areas and with the formulation of technical policies concerning these problems in the respective territories.—D. D. OGILVIE.

CAMERON, A. E. (1944). **Canadian veterinary service, it's wartime work.**—*J. Amer. vet. med. Ass.* **104.** 189–191. **657**

The Royal Canadian Army Veterinary Corps was disbanded in 1940. The acute shortage of veterinarians during the last war has consequently not been experienced during the present conflict, although difficulties in securing adequate personnel have been encountered in some districts. The vast increase in export of meat has necessitated the employment of many more veterinarians in the meat-inspection service. There is no apparent shortage of veterinary practitioners despite the fact that since the war most of the graduates from Canada's two veterinary colleges have entered the Government service.

Few notifiable diseases except swine fever in two counties and a few cases of rabies in Ontario, have occurred since 1939. This has allowed considerable progress to be made in tuberculin testing of cattle and calfhood vaccination for brucellosis. Much attention has been given to pig diseases, husbandry etc., following a vast increase in the pig population.

Regulations have been passed restricting the use of a number of vaccines to veterinary surgeons.

The setting-up of a Veterinary Medical Council to

represent all veterinary interests in Canada has been approved in principle.

Reorganization of the Canadian Department of Agriculture has resulted in the Meat Inspection Division and Contagious Diseases Division being included in Production Service, while the Pathological Division and laboratories have been placed under Science Service. This separation of the Divisions is regarded as a retrograde step by Canadian veterinarians who believe that a separate Canadian Veterinary Service containing both Divisions should exist.—D. D. OGILVIE.

TODD, F. A. (1944). **Veterinary service in Iceland.**—*Bull. U.S. Army med. Dep.* No. 73. pp. 85–90. **658**

The article gives an account of the activities of the veterinary detachment of the U.S. Army in Iceland. Inspection of the troops' food began immediately on arrival of the detachment, the food being chiefly canned, but it was supplemented by fresh lamb and fish purchased locally. The lambs were inspected before, during, and after slaughter and the carcasses frozen and stored.

Icelandic ponies, which are a little larger than Shetland ponies, were purchased for the Army Winter Welfare School and the veterinarians gave advice as to purchase, care, and feeding. Examination and treatment of sentry dogs was also carried out.

The Veterinary Corps co-operated with the Icelandic authorities in the control and investigation of the diseases of domestic animals in Iceland. Several thousand cattle were tested for TB. and contagious abortion and a number of diagnostic tests were demonstrated to local professional groups. Prevalent sheep diseases are described, including jaagziekte and abortion. Pig-raising is a new activity in Iceland which has been encouraged by the presence of garbage from the U.S. Army messes. In the summer of 1942, an outbreak of swine fever spread rapidly, but was quickly controlled by the U.S. Army veterinarians.

There are no serious endemic diseases in Icelandic cattle or ponies. The dogs are small and are mostly sheep dogs kept on farms. Poultry are few in numbers in Iceland; vitamin deficiency appears to be present in some flocks. Articles on the care and treatment of livestock and on milk production were prepared by the veterinary staff and published in all Icelandic newspapers. An illustrated booklet on safe milk production, disease control, and modern methods of animal husbandry was written and distributed to farmers, schools, and libraries.—T. E. GIBSON.

SUÁREZ, J. G. (1943). Anteproyecto para la creación de un servicio nacional de producción, defensa y sanidad pecuarias. **[Scheme for the establishment of a national service for the production, protection, and health of livestock].**—*Rev. Med. vet., B. Aires.* **24.** 384–400. **659**

S. outlines a scheme for the improvement of the livestock of the country by establishing departments for the technical direction of every branch of the livestock industries. The proposed departments, which would be staffed by teams of experts in the various subjects are (1) animal health, (2) fishery and game, (3) poultry, rabbits, and apiculture, (4) milk board, (5) hygiene department, and (6) institute of animal biology.
—ISOBEL W. BROCKLEHURST.

SUÁREZ, J. G. (1943). Reglamentación del ejercicio de la medicina veterinaria en Chile. **[Control of the practice of veterinary medicine in Chile].**—*Rev. Med. vet., B. Aires.* **24.** 376–383. **660**

This article consists of suggestions presented to the National Convention of Veterinarians, for the control of veterinary practice. The main objects appear to be the elimination of unqualified practice, and the extension of veterinary service to include inspection and control of foodstuffs and other products of animal origin, and of biological and chemical preparations for use in veterinary practice.—ISOBEL W. BROCKLEHURST.

LECOMTE, G., & LECOMTE, E. (1943). De l'application de la notion du "travail en commun" ou "coup de main" à la responsabilité civile du vétérinaire. **[The responsibility of the veterinarian in civil law].**—*Rec. Méd. vét.* **119.** 129–135. **661**

By a decision of the High Court of France (*Cour de Cassation*) of January 19th, 1938, the responsibility of blacksmiths when carrying out their work on horses was detailed, and tribunals throughout the country applied these findings to veterinarians in like manner under the terms of article 1385 of the civil code.

The involvement, however, of an accident to a farm worker assisting at a veterinary operation served to divide this responsibility between the employer of the worker and the veterinarian in such a way that neither principal had redress from the other. Two similar cases are recorded and these findings were upheld by a decision of the High Court of June 2nd, 1942, in which the law of April 9th, 1898, was cited as not allowing any redress between two principals conjointly employing a third party.—C. V. WATKINS.

MAC GREGOR, H. D. (1943). Los caprinos. Principales razas: su explotación y crianza. **[Principal breeds, exploitation, and management of goats].**—*Bol. tec. Direcc. gen. Agric. Ganad., B. Aires.* Secc. Ganad. No. 9. 571–599. **662**

After giving a description of the origin of the goat from its antelope-like ancestor (common to both sheep and goat), the author describes the conformation, milk-producing abilities, and other characters of the important breeds. He classifies goats into four groups. First, the Alpine group, including the Saanen and Toggenburg, secondly the Spanish group, including the Pyrenean and Malaguenan, thirdly the Asiatic group, which comprises Kashmir, Tibetan, Angora, Malayan, and Syrian types, and lastly the African group, consisting of the Maltese and Nubian types. He then deals with goat-keeping in all its aspects and suggests improvements in the present methods.—ISOBEL W. BROCKLEHURST.

MÖLLERS, B. (1943). Robert Koch im Reichsgesundheitsamt (1880–1885). Zur hundertsten Wiederkehr seines Geburtstages. **[Robert Koch in the Reich Public Health Office].**—*Reichsgesundheitsblatt.* **18.** 784–798. **663**

Phases of the career of ROBERT KOCH are described, and developments in the study of bacteriology in the German Public Health Office during his term of service there are discussed.

Koch was appointed to the Public Health Office in 1880. The chemistry and hygiene laboratories had just been reorganized and extended, but little room remained for Koch's bacteriological laboratory. Details of some of his investigations are given in a description by his first assistant, LOEFFLER. Later his staff was increased by the addition of GAFFKY, HUEPPE, and the chemists PROSKAUER and VON KNORRE.

In 1881, Koch accepted the post of technical adviser to the Military Veterinary Inspectorate. In the same year he developed the technique of studying pathogenic micro-organisms, the most notable advance being the introduction of solid transparent nutrient media.

In 1882, Koch isolated the tubercle bacillus. In the

same year, he was associated with the preparation of a book describing advances in hygiene in Germany. In that year, also, his laboratories were ravaged by fire.

The development of various lines of research by Koch and his co-workers, GAFFKY and LOEFFLER, is outlined, including the stabilization and utilization of animal lymph, the discovery of the diphtheria bacillus, and the study of typhoid and TB.

In 1885 Koch was elected Professor of Hygiene in the University of Berlin, and Director of the Institute of Infectious Diseases, and in consequence he requested to be allowed to resign from the Public Health Office. In actual fact, however, he worked unofficially with the staff of that Office and rendered them valuable and experienced aid long after his formal resignation.—O. CRUSE.

ELLIS, W. J. (1943). **Extra-uterine aseptic autolysis in the skin of the foetal lamb.**—*J. coun. sci. indus Res. Aust.* **16.** 173–178. **6**

In studies of the biochemical principles of fe mongering it was found that the mechanism whi brings about the release of the wool fibres from t follicles is essentially bacterial, but there was eviden that autolytic changes within the skin also play a pa As the sterilization of adult skin necessitates the use acids and alkalies, likely to influence subsequent aut lysis, it was decided to investigate the changes in piec of skin removed from foetal lambs under aseptic co ditions. The rate and degree of autolysis was assess by estimation of soluble nitrogen formation. The no protein nitrogen increased by approximately 25% the first 24 hours and at 40 hours had increased approximately 40%, after which little increase w noticed and in some a decrease was evident.

—B. JOHNSTON (AUSTRALI

REPORTS

CANADA. (1942). **Twenty-fifth annual report of the National Research Council of Canada, 1941-42.** pp. 33. Items of veterinary interest pp. 16–18. Ottawa. [8vo] [In English and French]. **665**

Investigations were carried out concerning transport and storage of perishable foodstuffs. Problems connected with the transport of bacon to Britain were the most important. Smoking bacon improves its keeping qualities, but it still requires to be stored in refrigerators during the voyage; it was therefore necessary to devise methods for converting large uninsulated cargo holds into refrigerated space. This equipment was designed by the staff of the Division of Applied Biology. The drying of pork was being investigated, as Canada can produce substantial quantities. Improved methods of processing canned poultry were tried out and assistance given to the industry to apply the procedures in production. The effect was studied of various canning processes on the vitamin C content of canned poultry; the thiamine content of canned pork was also assessed.—J. A. GRIFFITHS.

AUSTRALIA. QUEENSLAND. (1942). **Annual report of the Department of Agriculture and Stock for the year 1941–42.** pp. 27. Items of veterinary interest pp. 1 & 14–18. Brisbane: Govt. Printer. [fcp]. [1/-] **666**

Two outbreaks of ANAPLASMOSIS occurred during the year. *Babesia argentinum* INFECTION is much commoner than *B. bigemina*; tests with Australian-made acaprin gave satisfactory results and the preparations "pirevan" and "piroparv" were also satisfactory for the treatment of TICK FEVER. Arsenic-resistant ticks caused concern in some districts. "MYCOTIC DERMATITIS" was diagnosed in cattle for the first time in Queensland; there were three fatal cases. Other conditions mentioned are TUBERCULOSIS, MASTITIS, BRUCELLOSIS, BLACKLEG, BOVINE CONTAGIOUS PLEURO-PNEUMONIA, MACKENZIE RIVER DISEASE, ST. GEORGE CATTLE DISEASE, and SAWFLY [*Platypsecta interrupta*] POISONING, all in cattle; BRUCELLOSIS of swine; PARASITISM of sheep, pigs, and poultry.

The following plants were found to be cyanogenetic:—*Passiflora suberosa, Cynodon dactylon* probably var. *pulchellus*, and *C. plectostachyum*. *Malvastrum spicatum* caused "STAGGERS" in sheep. *Solanum seaforthianum* produced symptoms in sheep similar to those caused by other solanaceous plants. *Eremophila latrobei* caused death in sheep and goats.

The buffalo fly [*Lyperosia exigua*] extended its range eastward along the Mitchell River, crossed the Great Dividing Range and was established on the ea coast near Cooktown. The stickfast flea of poult (*Echidnophaga gallinacea*), was found in Queensland f the first time.

The report contains statistical and other informati given in the reports of the Chief Inspector of Stoc Senior Instructor in Sheep and Wool, Poultry Expe Registrar of Brands, Veterinary Surgeon's Boar Agricultural Chemist, and Veterinary Medicines a Stock Foods Investigation Branch.

—H. McL. GORDON (AUSTRALI

NORTHERN RHODESIA. (1942). **Veterinary Departmen Annual report for the year 1941.** [FERN, E. T.] p 10. Lusaka: Govt. Printer. [fcp]. **6**

Prophylactic inoculations against ANTHRAX a carried out by the European farmers; the nativ owned cattle are vaccinated by the staff of the veterina department. BOVINE CONTAGIOUS ABORTION is enzoo in the area along the railway. Inoculation of the cat on the infected farms has given excellent resul including the calves inoculated at 9–12 months old.

ANAPLASMOSIS does not cause serious losses. both cattle and dogs, trypan blue is being used for t treatment of PIROPLASMOSIS instead of acaprin, which not obtainable. An outbreak of EAST COAST FEV occurred in the Isoka and Chinsali district. The anima were slaughtered and no further outbreaks occurre 4,991 animals were treated for TRYPANOSOMIASIS wi tartar emetic, receiving a course of five injections; 9 other cattle received a single dose as a precautiona measure. Some of the cattle treated still harbour trypanosomes.

BOVINE CONTAGIOUS PLEURO-PNEUMONIA is co fined to the Barotse Province. 138,398 cattle we inoculated during the year with Kabete vaccin strain no. 8,471 proved to be the most satisfactory reactions were few and only 0·25% cases of the disea occurred. An outbreak of FOOT AND MOUTH DISEA occurred in the Senanga district. Intranasal and intr mucosal methods of inoculation were used. T vaccine for intranasal use consisted of normal saline co taining 2·5% sodium citrate, to which is added an equ quantity of mixed blood from three infected anima showing temperatures of 104°F. or more; a suspensi of epithelial debris was included. The infection whi resulted from this inoculation varied from mild severe, particularly with the foot lesions. The meth was later replaced by the intramucosal method, a vacci made of 150 ml. glycerin, 350 ml. water, 0·85 g. sodiu chloride, and 1 ml. vesicular lymph being used

the dose was 1 ml. RINDERPEST has not spread to the territory, but 18,000 cattle were vaccinated for the third time. Precautionary measures are being maintained by the use of guards to prevent the movement of animals across the border. HEARTWATER occurs throughout the territory. It is stated that uleron has been used with some success in the early stages of the disease. Dipping to prevent the disease being transmitted is still the mainstay in control.

MANGE and SENKOBO SKIN DISEASE were decreasing. No other scheduled diseases were reported during the year. A considerable number of deaths still occur from arsenical poisoning, due to carelessness in allowing animals to have access to dip.

No difficulty was experienced in marketing all available livestock and livestock products.

REPORT ON VETERINARY RESEARCH [LE ROUX, P. L.]—For six months of the year the research officer was engaged on field work, inoculating cattle with RINDERPEST vaccine, along the Northern Rhodesia—Tanganyika border of the territory. There was a decrease in the number of specimens submitted for examination in the laboratory; blood of a bovine animal examined contained spirochaetes and *Trypanosoma theileri*; anaplasms and piroplasms were recorded in other bovine blood smears.

CONTAGIOUS ABORTION and MALIGNANT OEDEMA occurred in the laboratory herd. Several imported bulls were immunized against REDWATER and ANAPLASMOSIS. EAST COAST FEVER was diagnosed in a herd from the Isoka district. In experiments at Chunga, it was shown that the immunity to RINDERPEST set up by formol-glycerinated spleen-pulp vaccine was still effective 13 months later against attenuated rinderpest goat virus. Three imported rams died of BLUE TONGUE; they had not been immunized. They all showed an unusual symptom—intense sweating, the perspiration dripping from the fleece.

SWEATING SICKNESS of calves occurred among native herds as well as in grade and pure-bred imported breeds. A six-year-old bull became infected and shed most of its coat, but recovered. In all infected animals there was intense hyperaemia of the mucous membranes and hypersensitiveness of the skin. Gastro-enteritis and broncho-pneumonia are serious sequelae.

A survey of the helminth parasites was continued; some species which normally infest wild game were found in domestic animals. There was a definite reduction in the numbers of variegated and bont ticks (*Amblyomma variegatum* and *A. hebraeum*) in areas where dipping was regularly carried out along with periodic burning of coarse pastures.

PSEUDO-URTICARIA of cattle was seen in both imported and local animals. The swellings were mainly on the flanks with the hair prominently raised on the oedematous portions of skin. These patches varied in size from ½–3 in. in diameter; they dried up and the scab eventually fell off, leaving no scar in the small areas but leaving a hairless patch where a large one was shed. Cases of BLOODY DIARRHOEA occur in cattle at the onset of the rains; the mortality is low. No coccidia are present.

The local cattle rarely suffer from plant poisoning. Specimens of a species of "tulp" not in flower, and a flowering species of *Morea*, collected at Shiwa, proved toxic when tested at the Onderstepoort laboratory.

Animal husbandry problems of the territory are discussed and recommendations made for improving the pastures and watering facilities, and also the goats and poultry of the country.

There were 629,688 cattle, and 16,477 were sent to the mining area to be slaughtered.—J. A. GRIFFITHS.

NIGERIA. **Shika Stock Farm report 1943.** pp. 10. [fcp] [Mimeographed]. **668**

There was an increase in the total of abortions and of still-born calves from all causes, including BRUCELLOSIS. All surviving cows were tested for brucella infection and 7% of the newly purchased cows were positive.

CALF SCOURS caused a calf mortality of 26·85% over a period of three years; figures show a quarterly mortality of 7·7% in the first quarter of 1941 increasing progressively to 62·5% in the first quarter of 1943, after which it tended to decrease, being 25·5%, 25%, and 17·7% in the following three quarters of 1943. Investigation showed that *Bacterium coli* is probably the cause of the condition in newborn calves, but in older calves *Salmonella enteritidis* is said to be more important. A vaccine prepared from cultures of the two organisms does not appear, on the figures given, to be as effective in reducing losses as the application of certain sanitary measures, particularly the protection of the calves from the attacks of *Stomoxys* and flies. Factors affecting satisfactory hygiene and peculiar to the conditions in West Africa help to maintain infection, as do also some degree of malnutrition and the practice of milking cows to record milk production and bucket-feeding the calves.

Calves kept in fly-proof pens and particularly when suckled, showed the greatest weekly weight increases in the first 12 weeks of life, even when sick calves were included in the record (rinderpest reactions complicate the figures of mortality rates given).

Twenty-eight animals were treated for TRYPANOSOMIASIS and 11 died. Of 12 cases confirmed by blood examination, 11 were due to *T. vivax* and one to *T. congolense*. Mechanical transmission by blood-sucking flies other than tsetse is thought to spread infection.

Immunization against RINDERPEST was carried out; attenuated goat virus with anti-rinderpest serum was used, with a resultant mortality of 8·9%.—J. A. G.

I. UGANDA PROTECTORATE. (1943). **Annual report of the Veterinary Department for the year ended 31st December, 1942.** [SIMMONS, R.] pp. 6. Entebbe: Govt. Printer. [8vo] [1s.]. **669**

II. UGANDA PROTECTORATE. (1943). **Annual report of the Veterinary Laboratory, Entebbe, 1942.** [CARMICHAEL, J.]—*Rep. vet. Dep. Uganda, 1942.* pp. 4–6. **670**

I. ANTHRAX, BLACKLEG, TRYPANOSOMIASIS and FOOT AND MOUTH DISEASE, occurred sporadically throughout the territory. BOVINE CONTAGIOUS PLEURO-PNEUMONIA appeared from time to time in quarantined cattle. RINDERPEST appeared during the year on the Sudan border and necessitated the vaccination of over 80,000 cattle in the West Nile area.

Pig rearing, a new industry to Uganda, is being carefully fostered and there are already 3,000 pigs in piggeries owned by Africans. Legislation to govern the new industry is under consideration. It is estimated that the total slaughter of stock for food purposes during the year was approximately 500,000 cattle and 700,000 goats; the number of sheep slaughtered could not be estimated. 1,933 tons of hides and 632,134 goat skins were exported, the value being £186,150.

Routine laboratory work comprised 9,000 blood and tissue examinations, 47 dip analyses, 49 milk analyses, 25 ghee analyses, 74 faecal egg counts, and 171 histological examinations. The laboratory clinic treated 144 privately owned animals during the year.

II. The previous work on 4 : 4′-diphenyl ether (M & B 736) in *Babesia canis* infection was confirmed and this drug is now advocated as the best treatment

for TICK FEVER in dogs. The drug was also shown to be effective in four cases of REDWATER in calves and it is suggested that it should be tested in BILIARY FEVER (*B. caballi* infection) in horses.

The compound 4 : 4′-diamidino dimethyl stilbene hydrochloride (M & B 991) was tested and found successful in small-scale trials against *Trypanosoma congolense* INFECTION. The phenanthridinium compound 897 proved disappointing against *T. congolense*, a dose of 2 mg. per kg. body weight giving a relapse rate of 50%. The prophylactic value of this compound was being assessed, protection apparently being given for about 48 hours. [See also CARMICHAEL *et al.*—*V. B.* **14.** 323.] The study of *T. congolense* infection continued. Attempts to attenuate the virulence of the parasite by passage through pigs and mice were unsuccessful. Serum from recovered cases in cattle and pigs was found to be of no therapeutic value.

Unsuccessful attempts were made to establish RINDERPEST virus in small laboratory animals. Observations on the viability of the virus preserved by freezing and drying showed that the infecting power was lost after ten months at 0°–5°C.

An atheromatous condition of the aorta of cattle, which is very common, was under investigation. *Onchocerca* sp. was found in the lesions.

Three students graduated from the Veterinary School during the year and six students were expected to enter the school in 1943.—D. D. OGILVIE.

I. UGANDA PROTECTORATE. (1943). **Veterinary Department. Annual report for the year ended 31st December, 1943.** [SIMMONS, R.] pp. 8. Entebbe : Govt. Printer. [fcp] [Sh. 1/-] **671**

II. UGANDA PROTECTORATE. (1943). **Veterinary Laboratory, Entebbe, annual report 1943.** [CARMICHAEL, J.]—*Rep. vet. Dep. Uganda, 1943.* pp. 6–8. **672**

I. ANTHRAX and BLACKLEG are confused by African owners of livestock ; it is thought that anthrax occurs rarely, as reports of deaths decrease in areas where blackleg vaccinations are carried out on a large scale. *Trypanosoma congolense* and *T. vivax* are the common trypanosomes of cattle. It was hoped to commence intensive treatment with phenanthridinium compound [see CARMICHAEL *et al.*—*V. B.* **14.** 323.] or some allied drug. EAST COAST FEVER continued to cause mortality in calves in many districts ; universal dipping had not been applied.

The spread of RINDERPEST from the Sudan, begun in 1942, continued through Buganda and the Western Provinces. The immunization of over 80,000 cattle in a belt of country extending 160 miles from the Belgian Congo border to the Acholi-Karamoja boundary and also along the bank of the East Nile did not check its spread. The disease is carried by infected game and has caused outbreaks among cattle further south. Altogether 250,000 cattle were inoculated with Kenya goat virus, but at the end of the year rinderpest was still active among game in northern and western Buganda. Difficulty was experienced in making an early diagnosis in cattle owing to the absence of the characteristic symptoms of rinderpest. Keratitis was the predominant symptom. It is suggested that the virulence of the virus had been attenuated by passage through game. Cases of RABIES were still reported from the West Nile district. Because of the increased demand for hides of first quality, an investigation of the distribution of DEMODECTIC MANGE in cattle was begun.

Measures to improve housing, feeding and care of livestock occupied much of the time of the staff. The development of the pig industry and milk and ghee production all showed progress.

Other sections of the department deal with stock markets and trade routes, hides and skins, and tsetse control.

II. The staff was depleted during the year. The Senior Veterinary Research Officer was employed part-time on war work and the Veterinary Research Officer was seconded to a full-time war post elsewhere. The Veterinary School was maintained, but research and even routine work was restricted. 11,946 specimens were examined.

The more soluble salt of 4 : 4′-diamidino diphenyl-ether, the ethanesulphonate (phenamide, M. & B 736) was found to be the most suitable drug for the treatment of TICK FEVER in the dog. The dose is 15 mg per kg. body weight given subcutaneously. 4 : 4′-diamidino dimethyl stilbene hydrochloride (M & B 991) has not proved satisfactory in the treatment of *Trypanosoma congolense* infection. The difference between the toxic dose and the curative dose in cattle is not sufficiently great. The phenanthridinium compound although very useful, is not completely efficient in *T. congolense* infection ; its low solubility, about 1%, is a disadvantage but the drug is not toxic. There were several instances in which cattle infected with *T. congolense* appeared to recover spontaneously. A *T. brucei* strain recovered from infected dogs was not fatal when inoculated into two cattle, although there was a thermal reaction and there was lymphadenitis for 21 days. CANINE DISTEMPER occurred in a severe form and was successfully treated in a few cases with serum obtained from recovered dogs.—J. A. GRIFFITHS.

ZANZIBAR PROTECTORATE. **Annual report on the Department of Agriculture for the year ended 31st December, 1943.** pp. 6. Items of veterinary interest p. 5. Zanzibar : Govt. Printer. [fcp] [75 cents]. **673**

Outbreaks of ANTHRAX occurred among cattle and goats and necessitated the vaccination of 503 cattle. In the abattoir, TUBERCULOSIS was detected in imported cattle but not in local stock. Cases of TRYPANOSOMIASIS occurred in cattle, donkeys, and dogs. Mass examination of the local cattle showed an incidence of infection of about 2% ; in one herd near Zanzibar town, 25% of animals were infected. Treatment with tartar emetic was unsuccessful. EAST COAST FEVER remained endemic. Sporadic outbreaks of CAPRINE CONTAGIOUS PLEURO-PNEUMONIA occurred. A severe outbreak of CANINE DISTEMPER caused high mortality in dogs in the Zanzibar district.

Cattle and goats continued to be imported for slaughter from Tanganyika and Somalia. Difficulties in feeding dairy cattle owing to local shortages were overcome by the feeding of sweet potatoes and rice bran, which proved very satisfactory.—D. D. OGILVIE.

BRITISH GUIANA. (1942). **Report of the Director of Agriculture, for the year 1941.** pp. 14. Items of veterinary interest pp. 7–8. Georgetown : Govt. Printers. [fcp] [For report for 1942, see *V. B.* **14.** 221]. **674**

Among the recommendations relating to agriculture made by the Legislative Council in 1941 are the adoption of a mixed farming policy and, as a corollary of this, intensive livestock production by the development of the soiling system of animal husbandry, and also the appointment of a livestock officer.

During the year an outbreak of FOOT AND MOUTH DISEASE occurred in the hinterland, and one case of ANTHRAX is also recorded.

Red Poll, Hereford and zebu bulls were imported to improve beef cattle, and the Holstein breed was being extended to increase milk production ; it is noted however, that crossing with the zebu or Indian breed

is necessary to maintain hardiness. Steps were also being taken to improve the local breeds of pigs and poultry.—U. F. RICHARDSON.

BRITISH GUIANA. (1944). **Report of Veterinary Division for 1943.** [FRASER, H. A.] pp. 15. [fcp] [Typescript]. **675**

A second veterinary officer was appointed during the year and also a livestock officer, to whom the veterinary division relinquished the control of the stock farm and breeding stations and all work on animal husbandry on the coastlands. Accounts are given of the work done on the stock farm and breeding stations prior to this, and of the establishment of a livestock experiment station on the savannahs, where the soil is deficient in minerals. This involved the feeding of bone meal to the stock and investigations into pasture improvement, with the establishment of imported grasses and forage plants, and also soil improvement. Some losses which are ascribed to mineral deficiency occurred among the 118 head of cattle on this farm during the rains, owing to difficulty in maintaining the supply of bone meal. The symptoms consisted of loss of condition, emaciation and "hard pill-like small faeces", the animals continuing to graze almost until the day of death. Six heifers aborted, and many cows were not in calf due to disturbance of the oestrous cycle. In calves, the principal symptom was acute diarrhoea. Of 23 affected animals fed a mineral supplement 21 made a good recovery.

A disease of horses occurred in Rupununi district which was suspected of being a virus infection; investigations are continuing.

The department is concerned with the maintenance of camps on the trail for the movement of trade cattle and the supervision of the health of these animals. The improvement of the hinterland livestock is discussed, and the introduction of zebu bulls is recommended.

Heavy rainfall is said to have caused severe stock losses in poorly drained areas. Two cases of ANTHRAX are recorded, and six cases of ANAPLASMOSIS, the latter being reported to be successfully treated [method of treatment not given].—U. F. RICHARDSON.

CYPRUS. (1944). **Annual report of the Director of Agriculture for the year 1943.** pp. 4. Items of veterinary interest pp. 2 & 4. Nicosia: Govt. Printing Off. [fcp] [3 piastres]. **676**

During the year, 1,116 specimens were examined. Vaccination of all sheep and goats against ANTHRAX was continued compulsorily and also the voluntary inoculation of other animals; 570,000 animals were inoculated. Heavy losses of sheep occurred from an acute catarrhal fever in which there was an acute stomatitis. Mortality varied from 1–60% in different flocks; about 2,000 deaths occurred. The disease appears to be due to a virus and is said to resemble BLUE TONGUE. Two strains of virus isolated were passaged four and six times respectively in sheep. There have been similar outbreaks on six occasions since 1924. A vaccine prepared from formalinized spleen pulp had no protective value.

Control of WARBLE FLY was maintained by giving a reward of £1 to farmers reporting the presence of warbles on cattle. As a result of the measures carried out in the previous four seasons, during which animals were inspected monthly and those found infested were dressed with a derris preparation, only 56 animals were found infested with larvae. Larvae identified were those of *Hypoderma lineatum* and *H. aeratum* [normally a parasite of Cyprus goats]. It was expected that all cattle warbles would have been eradicated by the next season, including *H. bovis* and *H. lineatum*.

Stud animals maintained by the Government Stock Farm were ten stallions, twenty-seven jack donkeys, 35 bulls, 46 Large Black boars, and 20 Maltese goats. There were also 119 stallions licensed under the Horse Breeding Law; most of them were used for jennet breeding.—J. A. GRIFFITHS.

LEEWARD ISLANDS. (1944). **Report by Chief Veterinary Officer, Leeward Islands, on animal health in general during the year 1943.** [HUTSON, L. R.]—*Rep. Dep. Agric. Leeward Is., 1943.* [2nd Pt.] pp. 1–5. **677**

The veterinary section of the department controls both animal health and animal husbandry.

The Colony is free from the majority of the serious infectious diseases. The major problems are BOVINE TUBERCULOSIS and PARASITIC INFESTATIONS. Tuberculosis in cattle and pigs is most prevalent in Antigua. A few cases occurred also in St. Kitts-Nevis and Montserrat. The Virgin Islands are free from the disease. A campaign is being carried on to test all cattle and to remove reactors in Antigua. FOWL TYPHOID and PULLORUM DISEASE in poultry and TETANUS in equine animals also occur. An outbreak of SWINE FEVER started at a piggery where garbage from a military camp was being fed; it spread to several neighbouring villages. There were 134 deaths, and 219 diseased and 276 in-contact pigs were destroyed. Active immunization with crystal-violet vaccine was given to 460 pigs. CANINE DISTEMPER, CHICKEN ROUP, and FOWL POX occurred. LYMPHOMATOSIS has been diagnosed in Antigua and the Virgin Islands. An attempt to control the disease by breeding methods is being made by selecting resistant parents. "EQUINE SICKNESS", a form of colic, has occurred every year since 1940 in St. Kitts-Nevis. Most of the cases occur from October to December. The cause has not yet been ascertained. There was a 35·3% mortality among 51 equine animals showing the symptoms; the death rate is the same in both horses and mules.

Haemonchus contortus in cattle and sheep and *Oesophagostomum columbianum* in sheep cause much damage. The use of pasture rotation and dosing with phenothiazine is recommended. Ticks are controlled in Antigua by spraying or dipping. Tick-borne diseases are rare; ANAPLASMOSIS occurred in one imported animal in Antigua.—J. A. GRIFFITHS.

I. JAMAICA. (1942). **Annual report of the Department of Agriculture for the year ended 31st March, 1942.** [LOCKETT, S.] pp. 18. Kingston: Government Printer. Items of veterinary interest p. 6. **678**

II. JAMAICA. (1944). **Annual report of the Department of Agriculture for the year ended 31st March, 1943.** [THRELKELD, T.] pp. 20. Kingston: Government Printer. Items of veterinary interest pp. 6–7. **679**

I. No outbreaks of ANTHRAX occurred. Tests of 470 cattle for TUBERCULOSIS showed 13 positive reactors. BLACKLEG is widespread and is controlled by vaccination. NECROBACILLOSIS is annually recurrent in goats in many parts of the Island; treatment with tar ointment is effective. Six sporadic outbreaks of TEXAS FEVER occurred during the year. Six outbreaks of ANAPLASMOSIS occurred. Outbreaks of SWINE FEVER occurred in several districts; vaccination with Boynton's tissue vaccine exercised satisfactory control. LIVER FLUKE INFESTATION of cattle and sheep continues to receive attention. The incidence of the chief diseases of poultry, *viz*, FOWL CHOLERA, ROUP, and FOWL POX, was about the same as in previous years.

II. The veterinary division comprised one veterinary officer, one stock inspector, one junior technical assistant, and a stenographer.

An assisted scheme of vaccination against ANTHRAX, BLACKLEG, and SWINE FEVER was in operation during the year; some 11,600 animals were vaccinated. Of 20 suspected cases of ANTHRAX investigated, one was proved positive; one major outbreak occurred, about 5,600 cattle being vaccinated. Eight outbreaks of BLACKLEG occurred and 3,100 animals were vaccinated. Four major cases of *Babesia bigemina* INFECTION were investigated. There was a shortage of dipping materials and suitable drugs to ensure control.

Of 20 suspected outbreaks of SWINE FEVER investigated, six proved positive; about 2,800 pigs were vaccinated with crystal-violet vaccine; it is hoped eventually to vaccinate all swill-fed pigs. HELMINTHIASIS remained the worst enemy to stock and presents a problem which cannot be tackled until the staff of the department is increased. PULLORUM DISEASE, FOWL POX, and BLACKHEAD in turkeys were the chief diseases of poultry encountered.

Major disease problems continue to be CONTAGIOUS ABORTION, STERILITY, digestive troubles, and tick and other parasitic infestations. Tuberculin tests of the cattle revealed only one reactor. Calfhood vaccination is being used to control contagious abortion.

Experiments were conducted during the year with phenothiazine, stilboestrol dipropionate, acriflavine, and sulphanilamide in the treatment of various conditions.
—D. D. OGILVIE.

U.S.A. (1943). **United States Department of Agriculture, Agricultural Research Administration, Bureau of Animal Industry. Fourth annual report of the Regional Poultry Research Laboratory, East Lansing, Michigan, July 1, 1942—June 30, 1943.** [WINTON, B.] pp. 21. [4to] [Mimeographed]. **680**

The current objectives of the laboratory, as in previous years, were to develop measures for the prevention and control of the avian leucosis complex through studies in genetics, pathology, physiology, nutrition, and management. A high mortality due to lymphomatosis had previously occurred in all chicks reared at the laboratory. During the year under review, 91 White Leghorn chickens had reached an average age of 300 days, without the appearance of clinical lymphomatosis or any other manifestation of the avian leucosis complex. In a second group of 51 birds, brothers and sisters of those in the "free" group, there was a mortality of 27·5% from lymphomatosis in 300 days. The chickens in both groups came from eggs produced by a mating of four hens and a male from two outstanding families which had not shown any clinical or gross manifestation of lymphomatosis up to the time of these matings. In the first group the eggs were incubated during the first 18-day period with eggs from the mixed population, but were hatched and the chickens brooded and maintained in isolated and quarantined quarters; the second group was hatched, brooded, and maintained in separate quarantined quarters, but with chickens from another parental stock, many of which subsequently developed lymphomatosis.

This experiment is considered to add to the evidence already accumulated that lymphomatosis is transmitted from parent to offspring through the hatching egg and that the disease is also definitely transmitted by mechanical means, and/or by contact with infected chickens. The availability of "free" stock will greatly facilitate transmission studies, as, in the past, data relating to inoculation experiments were often deficient since many birds were probably affected before being inoculated.

Owing to the long incubation period of the naturally occurring disease, experimental work, with three variants having a much shorter incubation period, was undertaken to determine what factors influence the incidence of the disease following inoculation and how the viability of the agent from affected birds can be preserved.

The three strains used were: strain 3 (RPL–3), a strain of osteopetrosis-lymphomatosis, the inoculum consisting of whole blood [early phases of the work with this strain were described by BRANDLY *et al.*—*V. B.* **14.** 16.]; strain 4 (RPL–4) a strain producing erythrogranuloblastosis, the inoculum again consisting of whole blood [origin and description of this strain given by HALL *et al.*—*V. B.* **12.** 227.]; and strain 12 (RPL–12), a strain of transplantable tumour obtained from the Massachusetts Agricultural Experiment Station, the inoculum consisting of tumour cell suspension or whole blood from positive cases.

Details are also given of work carried out in co-operation with various state agricultural experiment stations, including the influence of varying types of management on the incidence of lymphomatosis and the development of families resistant to the disease. Other stations dealt with the diagnosis and localization of fowl paralysis lesions in the central nervous system, the association of enteritis with the avian leucosis complex, studies of histopathology of lymphomatosis and the distribution of the agent in the tissues, and the relationship of the avian leucosis complex to reproductive disorders.—J. D. BLAXLAND.

See also absts. **524, 555, 556** (U.S. Live Stock Sanitary Association committees).

BOOK REVIEW

DETWILER, S. R. [Professor of Anatomy, College of Physicians & Surgeons, Columbia University]. (1943). **Vertebrate photoreceptors.** pp. x + 184. New York: Macmillan Company. [8vo] [$4.00]. **681**

It is stated that the mode of life of the animal appears to be correlated closely with the structure of the retina. With this as a basis a review is given, for the appreciation of the student of biology rather than of the specialist, of the structure and function of the visual cells. The association of the retinal rods and cones with diurnal and nocturnal vision, their change of shape in response to illumination and the influence on visual definition of their size and number per unit area are all discussed.

An area of retinal specialization occurs in most vertebrates. In its most highly developed form it is known as the fovea and is characterized by a spreading apart of all retinal layers except the cones. It is usually stated that the function of this area is to permit light to fall directly upon the cones, but the suggestion is here discussed that this structure is a mechanism for increasing the resolving power of the retina.

The dependence of vision upon the presence of vitamin A in the diet and also the association of this vitamin with the formation of visual purple are also reviewed.—C. W. OTTAWAY.

See also abst. **603** (penicillin).

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